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CALENDAR YEAR 2000 POLLUTION PREVENTION ANNUAL DATA SUMMARY (P2ADS)

by

Environmental Information Systems Branch
Environmental Quality Division

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13. ABSTRACT (Maximum 200 words) The purpose of this report is to summarize the Navy's status toward meeting the Department of Defense Measures of Merit goals for hazardous and solid waste. The report includes an overview of the Navy's progress, tables showing breakouts of the information for each claimant, and success stories for 2000.				
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EXECUTIVE SUMMARY

The Pollution Prevention Annual Data Summary (P2ADS) tracks the Department of the Navy's progress in meeting the Department of Defense Measures of Merit goals for solid waste and hazardous waste.

The Measures of Merit goal for hazardous waste calls for a 50% reduction of wastes transferred offsite by 1999 using 1992 as a baseline. The Navy has exceeded the hazardous waste Measures of Merit goal for four consecutive years, 1997-2000. In Calendar Year 2000, the Navy reduced the amount of hazardous waste shipped offsite by 69% using CY92 data as the baseline.

The Measures of Merit goal for solid waste is to ensure the diversion rate for non-hazardous solid waste is greater than 40% by Fiscal Year 2005. This reduction must be accomplished while ensuring integrated non-hazardous solid waste management programs provide an economic benefit when compared with disposal using land filling and incineration alone. The Navy has exceeded the solid waste Measures of Merit goal for 2000. This is the third consecutive year of achieving the goal. Solid waste diversion made a slight decrease from last year's record pace of 41.49% diversion to 41.10% for 2000. Navy data also shows a positive trend in composting tonnage increasing from 700 tons to 8,530 tons.

Other select waste diversion increased by 4.5% to a 59.76% diversion rate. Other select waste data shows an increase in recycling percentages. Other select waste provided the extra diversion to propel the Navy over the solid waste Measures of Merit goal for 2000.

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CY00 Pollution Prevention Annual Data Summary (P2ADS)

NAVY

Section 1, Hazardous Waste (HW). See summary and backup information beginning on Page 5.

1. Number of installations reporting HW: 118.
2. Number of installations with a Pollution Prevention Plan: 114.
3. Total hazardous waste disposal cost: \$34,238,723.
4. Number of RCRA Subtitle C permits held by installations: 40.
5. Number of installations that have initiated the Consolidated Hazardous Material Reutilization and Inventory Management Program (CHRIMP): 98.
6. Hazardous waste process summary in thousand pounds:

	Generated	Backlog	Stored	Treated	Recycled Onsite	Manifested Offsite
BD	1,113	4	5	195	0	917
CP	513	10	4	7	0	511
EP	3,556	16	25	3,192	0	355
ES	2,223	143	168	38	78	2,082
FC	4,862	234	216	986	56	3,839
FP	15,724	697	694	2,271	45	13,399
NR	12,063	625	245	74	0	12,368
PD	6,603	590	344	343	19	6,486
SP	26,989	196	258	337	930	25,661
Total	73,646	2,514	1,959	7,442	1,128	65,618

Process code definition:

BD. Bilge/tank cleaning & derusting CP. Chemical paint stripping EP. Plating shop waste ES. Expired shelf life/excess materials, non-ship FC. Fluids changeout	FP. Facilities operations NR. Non-recurring PD. Painting/depainting/surface finishing SP. Ship operations
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7. Hazardous waste success stories: See Appendix A.

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CY00 Pollution Prevention Annual Data Summary (P2ADS) NAVY

Section 2, Solid Waste (SW) and Other Select Waste (OSW). See summary and backup information beginning on Page 19.

1. Number of installations reporting: 107.
2. Number of installations with a Solid Waste Management Plan (SWMP): 93.
3. Number of installations with a Qualified Recycling Program (QRP): 77
 Total Annual QRP Tons Recycled: 83,202
 Total Annual QRP Costs: \$ 6,543,473
 Total Annual QRP Revenues: \$ 5,008,730
4. Number of installations with composting facilities: 14
5. Number of installations that have an active RCRA permitted landfill: 10.

6. Solid waste operations summary:

Operation	Tons	Cost (\$)	Revenues
Landfilled	415,850	29,185,606	N/A
Incinerated	71,638	9,749,321	0
Composted	8,530	632,487	0
Recycled	156,405	9,231,373	\$19,453,608

7. Solid waste recycled summary by category (tons):

Food	831
Glass	1,761
Metals	80,618
Other Non-Food	21,618
Paper	37,313
Plastic	835
Wood	7,923
Yard/Green Waste	5,506
Total Tons Recycled	156,405

8. Other select waste summary:

Waste Stream	Disposal (Tons)	Disposal Cost (\$)	Recycled (Tons)	Recycled Revenues (\$)	Recycled Cost (\$)
C&D	213,958	5,646,996	320,576	604,583	161,727
Oils	8,555	773,633	8,602	511,363	156,211
Antifreeze	126	130,962	188	109,356	1,148
Lead-Acid Batteries	79	81,664	1,358	75,076	33,053

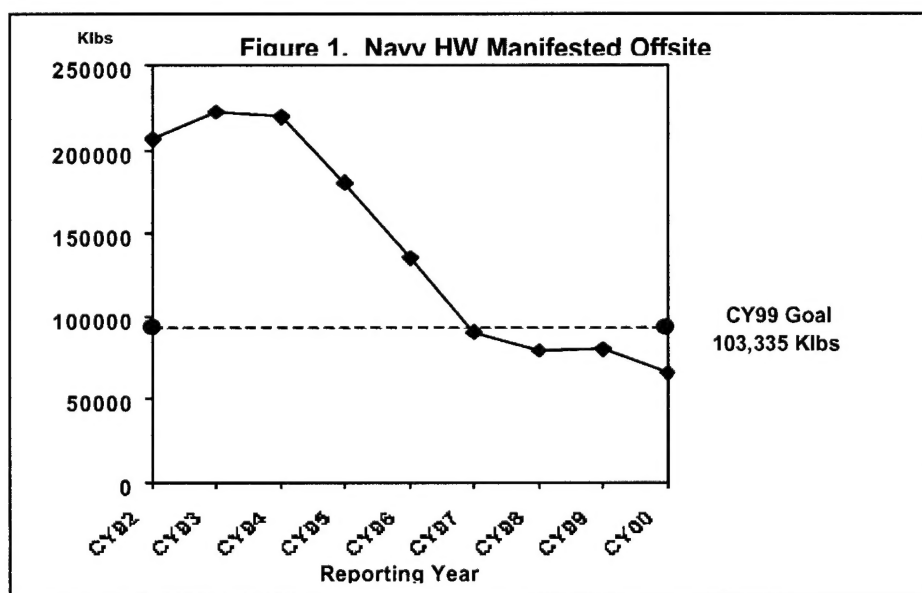
9. Solid and other select waste success stories: See Appendix B and Appendix C.

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SECTION 1

CY00 HAZARDOUS WASTE SUMMARY

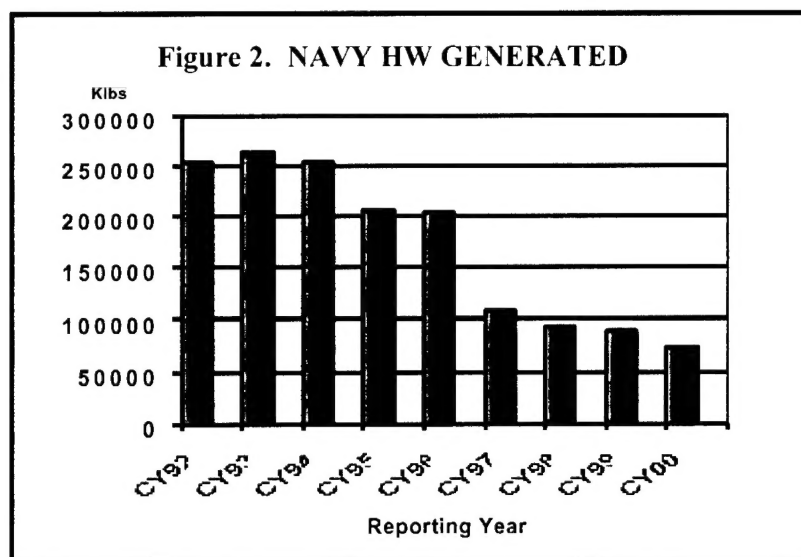
Navy Offsite Review. Calendar year (CY) 2000 was another successful year for the Navy. The Navy reduced hazardous waste transferred offsite 18% (14,832 K-pounds) since the CY99 report. The Navy's Measure of Merit goal is to reduce by 50% the amount of hazardous waste shipped offsite using the CY92 data as the baseline. The Navy has exceeded this goal four conservative years. In CY00, the Navy decreased the amount of HW sent offsite by 69% (65,618 K-pounds). Figure 1 shows the Navy has exceeded the 50% goal by 37,717 K-pounds.



HW manifested offsite is all wastes recycled offsite and disposed offsite. In CY00, offsite wastes show a decrease of 14,832 K-pounds compared to CY99. Recycled offsite decreased 26% and disposed offsite decreased 17% compared to CY99.

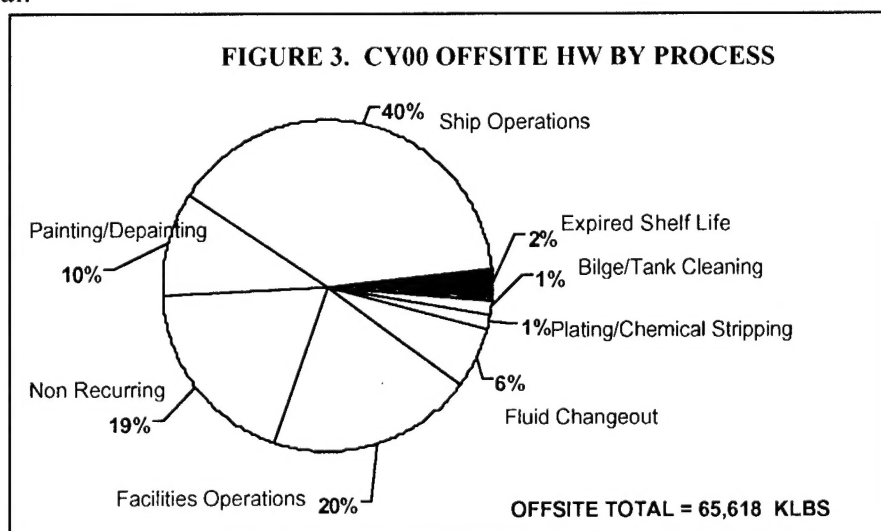
Reporters. In CY00, 118 installations generated 73,646 K-pounds of HW. The number of reporting installations has decreased by six since CY99. The decrease is a result of: six installations changed their generator reporting class from Class 2 to Class 3; four installations closed; two installations becoming tenants of another installation; five changed their generator Class from 3 to Class 2; and one installation that was previously a tenant reported for themselves.

Generated Totals. Figure 2 shows total hazardous waste generated by calendar year. Overall generation has decreased 71% (179,990 K-pounds) since the CY92 baseline report. This demonstrates the great progress Navy installations have made in reducing hazardous materials at the source.



Process Review. Ship operations, facility operations, and non-recurring wastes processes account for 40% (25,661 K-pounds), 20% (13,399 K-pounds), and 19% (12,368 K-pounds), respectively, of the offsite total.

Figure 3 is a breakout of offsite wastes by process. The largest process, ship operations, decreased 3,034 K-pounds (11%) compared to CY99. Ship operations have been the process with the largest quantity of wastes shipped offsite since CY92. The process includes bilge/tank cleaning; ships decommissioning; and all wastes generated during a ship's operation.



The second largest process in CY00 is facilities operations with 13,399 K-pounds. This is 494 K-pounds less than CY99. In the previous three years, the process non-recurring waste has been the second largest process. Non-recurring waste includes the disposal of asbestos, PCB, spill cleanup, underground storage tank removal, and base closure wastes.

Navy and Claimant Summaries. The tables in Section 1 Backup Data show a comparison of the Navy's offsite totals for calendar years 1992-2000 and claimant totals for the number of installations with Pollution Prevention Plans, CHRIMP, RCRA permits, and HW management costs.

SECTION 1
BACKUP DATA
CY92-00 NAVY COMPARISON

(Excluding IR and RC) in K pounds

	<u>OFFSITE RECYCLED</u>	<u>OFFSITE DISPOSED</u>	<u>OFFSITE TOTAL</u>
CY92	61,940	144,727	206,668
CY93	64,829	157,732	222,562
CY94	40,222	179,840	220,062
CY95	21,867	159,065	180,932
CY96	42,949	96,229	139,118
CY97	10,075	79,932	90,007
CY98	13,780	65,632	79,413
CY99	12,877	*67,573	*80,450
CY00	9,620	55,999	65,619

Offsite = Recycled Offsite + Disposed Offsite

* These are corrected totals resulting from a revised report submitted by one installation after publication of the CY99 P2ADS. The CY99 data showed disposed offsite as 67,557 and offsite as 80,434.

SECTION 1 BACKUP DATA
CY92-00 COMPARISON OF TRANSFERRED OFFSITE
BY CLAIMANT

(Excluding IR and RC) in K pounds

	CY92	CY93	CY94	CY95	CY96	CY97	CY98	CY99	CY00
BUMED	61	83	123	170	152	223	188	222	101
CNET	4,270	2,203	4,089	7,748	2,933	1,310	1,856	5,795	1,179
CNO	401	420	693	508	634	1,027	5,629	854	1,627
LANTFLT	23,640	29,419	53,200	23,273	29,220	9,636	13,590	8,968	9,486
NAVAIR	5,601	4,910	3,545	6,214	6,204	4,709	5,194	2,597	5,472
NAVEUR	1,654	1,880	1,843	9,156	14,597	1,132	4,250	1,212	1,867
NAVFAC	68,919	75,919	48,378	35,879	31,304	9,829	10,223	9,006	3,506
NAVMETOC	0	6	2	4	0	0	0	0	3
NAVSEA	27,861	28,032	29,646	26,511	28,270	35,411	20,082	28,787	25,216
NAVSECGR	14	3	193	27	26	29	238	321	464
NAVSUP	675	0	0	0	0	0	0	0	0
NAVSYSMGT	0	0	0	0	0	6	5	4	6
NAVTELCM	519	28	59	71	122	413	171	131	715
NVRESFOR	506	261	279	217	405	476	1,913	1,153	704
OCNR	129	30	207	21	61	38	111	36	30
ONI	0	0	0	0	0	20	0	0	3
PACFLT	71,869	78,839	77,504	69,959	24,658	25,537	15,900	21,327	15,190
SPAWAR	253	205	162	1,175	380	212	64	36	50
SSPO	298	324	139	0	211	0	0	0	0
NAVY TOTALS:	206,668	222,562	220,062	180,932	139,177	90,007	79,413	80,450	65,618

Transferred Offsite = Recycled Offsite + Disposed Offsite

SECTION 1 BACKUP DATA
CY00 HAZARDOUS WASTE MANAGEMENT SUMMARY
BY CLAIMANT

CLAIMANT	NUMBER OF INSTALLATIONS				RCRA TSD PERMITS	HW MANAGEMENT COSTS (\$)	GENERATED KLBS
	REPORTING	WITH P2 PLANS IN PLACE	IMPLEMENTING CHRIMP				
BUMED	6	5	4	1	121,437	101	
CNET	8	8	5	4	758,383	1,186	
CNO	5	5	3	1	643,770	1,620	
LANTFLT	21	21	18	12	9,047,112	9,962	
NAVAIR	6	5	5	1	1,329,519	5,961	
NAVEUR	5	4	4	0	697,083	2,045	
NAVFAC	4	3	3	*6	1,356,487	3,527	
NAVMETOC	2	2	2	0	14,438	6	
NAVSEA	18	18	14	12	12,407,118	29,977	
NAVSECGR	3	3	3	0	139,817	462	
NAVSYSMGT	1	1	0	0	35,000	6	
NAVTELCM	2	2	1	0	6,986	268	
NVRESFOR	5	5	5	0	180,947	719	
OCNR	1	1	1	1	187,338	30	
ONI	1	1	1	0	2,127	3	
PACFLT	29	29	28	2	7,251,935	16,758	
SPAWAR	1	1	1	0	59,225	1,006	
NAVY TOTALS:	118	114	98	40	\$34,238,723	73,638	

*Two Class III BRAC activities have permits.

SECTION 1 BACKUP DATA
CY00 HAZARDOUS WASTE DISPOSITION SUMMARY
BY CLAIMANT
(Excluding IR and RC) in K pounds

CLAIMANT	GENERATED	BACKLOG	STORED	TREATED	<u>RECYCLED</u>		DISPOSED	TRANSFER
					ONSITE	OFFSITE	OFFSITE	OFFSITE
BUMED	101	11	12	0	0	8	93	101
CNET	1,186	6	12	0	0	25	1,154	1,179
CNO	1,620	10	8	0	0	122	1,501	1,623
LANTFLT	9,962	941	809	497	99	1,000	8,485	9,486
NAVAIR	5,961	107	107	486	3	604	4,868	5,472
NAVEUR	2,045	131	284	0	25	346	1,521	1,867
NAVFAC	3,529	7	12	18	0	1,877	1,628	3,506
NAVMETOC	6	1	0	0	0	0	7	7
NAVSEA	29,981	420	305	4,034	0	1,404	24,657	26,062
NAVSECGR	464	0	0	0	0	18	445	464
NAVSYSMGT	6	0	0	0	0	2	4	6
NAVTELCM	268	467	20	0	0	5	709	715
NVRESFOR	719	33	47	0	0	90	614	704
OCNR	30	0	0	0	0	0	29	30
ONI	3	0	0	0	0	2	1	3
PACFLT	16,759	379	341	1,451	1,002	4,091	10,253	14,345
SPAWAR	1,006	0	0	956	0	22	28	50
NAVY TOTALS:	73,646	2,514	1,959	7,442	1,128	9,620	55,999	65,618

Recycled offsite + disposed offsite = Transferred offsite

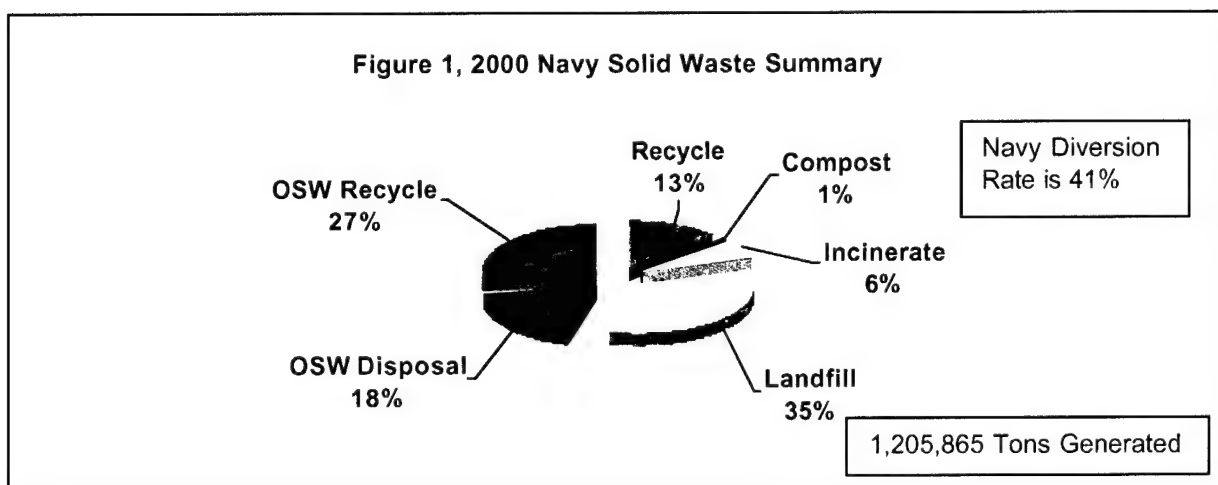
SECTION 2

CY00 SOLID WASTE SUMMARY

CY 2000 Navy Summary. The Navy has met the Department of Defense (DOD) solid waste Measures of Merit (MOM) goal for the third consecutive year. The economic benefit for 2000 is also positive showing an integrated waste management cost avoidance of \$19,453,608. Solid waste diversion made a slight decrease from last year's record pace of 41.49% diversion to 41.10%. Other select waste diversion increased by 4.5% to 59.76%. Other select waste provided the extra diversion to propel the Navy to the goal.

Good news for 2000 is that composting tonnage was up by over 700 tons to 8,530 tons. Some disappointing news is that solid waste diversion, not counting other select waste, dropped to a 25.28% diversion rate from 29.29% in 1999. This was caused by an increase in both land filling and incineration tonnage along with a decrease in recycling. Other select waste recycling of construction demolition, oils, antifreeze and lead acid batteries provided the cushion to push the Navy over the DOD MOM goal.

Figure 1 shows 2000 Navy solid waste generation as a pie chart containing 1,205,865 tons, a decrease of about 48,000 tons from 1999. The components are expressed as percentages.



P2ADS Data Collection. P2ADS, solid waste section, tracks the cost/revenues and amount (tonnage) of Navy solid waste in four ways: land filling, incineration, recycling and composting. With these figures, and the local tipping fee, the Department of Defense (DOD) Measures of Merit (MOM) for "non-hazardous solid waste" can be calculated. Other select waste (OSW) is collected in more detail and is used in the MOM calculations.

Other Select Waste (OSW) Collection. OSW collects recycling and disposal information for construction and demolition waste, used motor oil, waste ethylene glycol based antifreeze, and waste lead acid batteries. Prior to 1999 construction and demolition debris (C&D) was collected with the municipal solid waste. Though these wastes could be either hazardous or non-hazardous depending upon state or local laws, they are counted toward the Department of

Defense Solid Waste Measures of Merit. Because of its nature, there are many vendors available to recycle OSW waste and if Navy installation solid waste managers take advantage of this, overall diversion rates should increase. OSW data for this year shows an increase in recycling percentages.

Department of Defense Solid Waste Goal. The Measures of Merit (MOM) goal is ***“By the end of FY2005, ensure the diversion rate for non-hazardous solid waste is greater than 40%, while ensuring integrated non-hazardous solid waste management programs provide an economic benefit when compared with disposal using landfilling and incineration alone.”***

The goal is based on a rate that can be calculated with each year’s data thus eliminating the need for a baseline or base year. Waste diversion from land filling or incineration can be measured by the data we collect in the P2ADS. The equation for calculating the diversion rate is shown below:

$$\text{Diversion Percent} = \frac{\text{Tons Recycled} + \text{Tons Composted} + \text{Tons Other Select Waste Diverted}}{\text{Tons Recycled} + \text{Tons Composted} + \text{Tons Incinerated} + \text{Tons Landfilled} + \text{Tons Other Select Waste}} \times 100$$

The economic part or economic benefit of the goal compares the cost of diversion and disposal. A positive number shows that the cost of diversion is less than if all the waste were disposed in a landfill or incinerator. The equation accounts for recycling and composting revenues. While individual installations may have a negative economic benefit the Navy will almost always have a positive number. The economic benefit or integrated solid waste management cost avoidance equation is shown below:

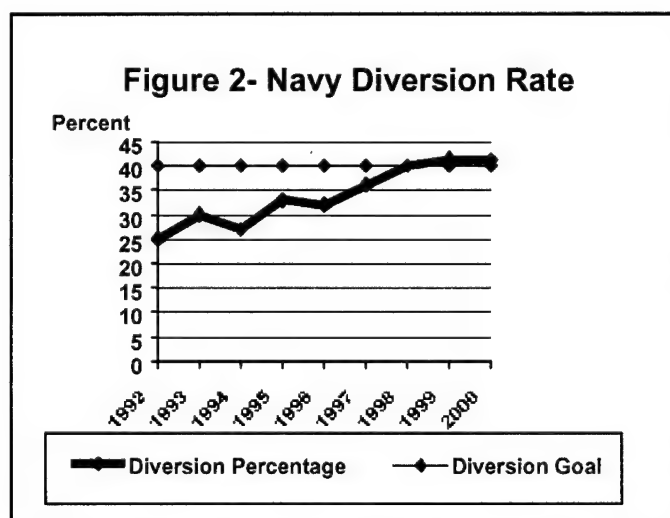
$$\text{ISWMCA} = \text{PDC} - \text{ADC}$$

Where:

ISWM CA = integrated solid waste management cost avoidance (in dollars).

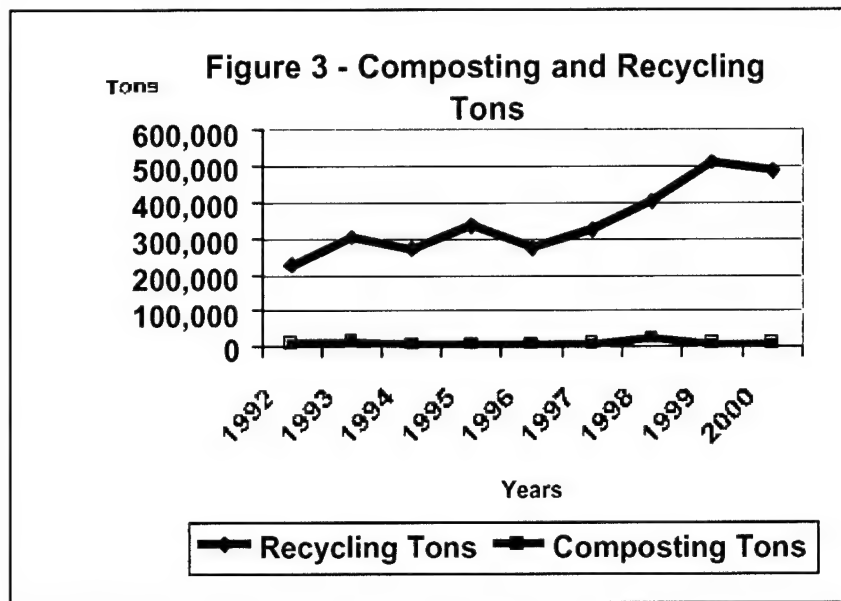
PDC = Potential disposal cost (cost, in dollars, if all waste were land filled or incinerated.)

ADC = Actual disposal cost of integrated solid waste management (in dollars).

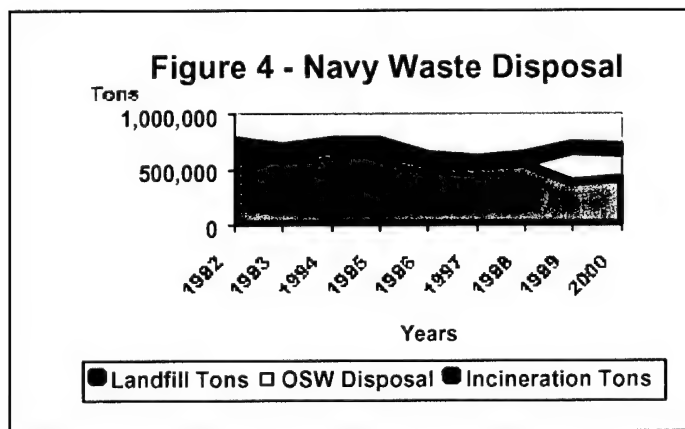


Navy Diversion Percentage. Figure 2 shows the Navy diversion rate for 2000 as 41.10%. The diversion rate includes OSW (C&D, waste motor oils, lead-acid batteries, and ethylene glycol antifreeze). This helped the diversion rate to 41.10%, a slight decrease from last year’s 41.49%. Without OSW the solid waste diversion would be 25.28%. The Navy recycles considerably more C&D than is recycled from the refuse waste stream. It’s not hard to understand that recycled dense construction material, such as concrete and metals, can add significantly to the diversion rate.

Figure 3 shows the composting and recycling tonnage since 1992. Navy composting increased from 7,820 tons to 8,530 tons for 2000. CY98 marked the highest point of Navy composting, when PWC Pearl Harbor's composting operation was in full production composting sewage sludge. The sewage treatment plant has been modernized and produces less sludge. Refuse recycling declined from 179,754 tons to 156,405 tons in 2000 a decrease of 23,349 tons. The refuse recycling decrease was most dramatic at NAVSEA, PACFLT, LANTFLT and NAVAIR installations. In contrast, OSW recycled decreased by less than 2,000 tons from 332,591 to 330,723 tons.



Recycling includes both recycled refuse and recycled other select waste (OSW). The Navy recycled 487,128 tons. This includes recycling of construction and demolition, waste oils, batteries, and antifreeze as well as traditional installation recycling refuse. In past years, C&D recycling were included in the overall recycling figures and we could not determine the amount contributed by C&D. As shown in Figure 3, the recycling trend has been upward since 1996 but shows a slight decline for 2000.



Navy waste disposal is sending a mixed messages again this year. Figure 4 shows an overall decrease in disposal from the previous year. However, incineration and refuse disposal increased slightly while OSW disposal decreased by a much greater amount. Thanks to the decrease in OWS, the overall trend for disposal is down for 2000.

select waste disposal showed a decrease from 280,640 tons to 222,718 tons. Table 1 shows the actual figures for 1999 and 2000.

COMPARISON OF 1999 AND 2000 DISPOSAL		
Disposal Catagory	1999	2000
Landfill Tons	383,584	415,850
Incinerated Tons	69,244	71,638
OSW Tons	280,640	222,718
Total Disposal Tons	733,468	710,206

Table 1, Navy Disposal

Solid Waste Disposal Reduction from 1992. The original MOM solid waste disposal reduction goal called for a 50% reduction by 1995 from a 1992 baseline. The Navy's base year landfill and incineration disposal was 769,846 tons, which sets the disposal reduction to 384,923 tons. Figure 4 shows the

Navy's gradual but bumpy decline to 710,206 tons for 2000. This amounts to a 7.75% reduction since 1992.

Economic Benefit Subpart of MOM Goal. The economic benefit or integrated solid waste management cost avoidance is calculated by using the following equation discussed earlier. It is: $ISWMCA = \text{Potential Disposal Cost (PDC)} - \text{Actual Disposal Cost (ADC)}$. In general, a positive value resulting from the calculation shows cost avoidance. A negative value shows that recycling is more costly than disposal. This may not be true, but is a result of the factors considered in the calculation such as tipping fees, recycling, composting, and other fixed disposal cost. For example, a low tipping fee tends to result in a negative ISWMCA. The Navy's ISWMCA has always been positive. Overall, for 2000, the Navy has a positive ISWMCA of \$19,453,608.

Cost of Solid Waste

Management. We collected operation cost for land filling, incineration, composting, recycling, and other select waste. The overall cost for Navy solid waste management was \$57,455,698 for handling 1,205,865 tons of solid waste. Table 2 shows the overall cost for each solid waste operation as well as its cost per ton. The cost includes the total cost to the

Navy Solid Waste Cost for 2000 (\$)		
Operation	Cost	*Cost Per Ton (\$)
Land filling	29,185,606	70.18
Incineration	9,749,321	136.09
Composting	632,487	74.15
Recycling	9,954,280	19.87
OSW Disposal	6,633,625	29.78
OSW Recycling	1,300,379	2.87
Total	\$57,455,698	

*Cost per ton includes adjustment for revenues.

Table 2, Navy Solid Waste Cost

Navy to operate or contract for land filling, incineration, composting, recycling, and disposal and recycling OSW worldwide. The cost column does not reflect adjustments for avoided disposal cost or recycling revenues. The cost per ton does account for revenues and shows the Navywide cost per ton for each operation.

Navy Recycling Program. The Navy generated \$6,845,937 in recycling revenues from the sale of 156,405 tons at a cost of \$9,954,280. This year's data shows a cost of \$19.87 to recycle a ton of Navy scrap. This is the first year that recycling has not shown a profit. This is a total Navy figure that includes the Qualified Recycling Program (QRP) and Navy Working Capital Fund

(NWCF) recycling programs. OSW recycling amounted to 330,743 tons at a cost of \$1,300,379 and \$352,409 in revenues for an overall recycling cost of \$2.87 per ton. QRP showed an overall loss for 2000. Losses in QRP are made up with installation operations funds.

Qualified Recycling Program (QRP) Only Data. For 2000 P2ADS, we collected QRP data separately for the first time since 1996. The data shows that QRP recycled 83,202 tons at a cost of \$6,543,473 with revenues of \$5,008,730.66. This resulted in an overall loss of \$1,534,742.76 for the Navy QRP. Installation QRPs are replacing no cost military labor with government employees. This increases QRP cost and is probably responsible for the loss in 2000. Table 3 shows the profit and loss for each claimant's installations.

QRP Profit or Loss for 2000			
Claimant	Revenues (\$)	Cost (\$)	Profit or (Loss) (\$)
BUMED	26,736.34	94,500.00	(67,763.66)
CNET	374,315.80	412,678.35	(38,362.55)
CNO	227,219.00	537,707.00	(310,488.00)
LANTFLT	1,893,794.54	1,899,147.06	(5,352.52)
NAVAIR	280,572.00	916,323.00	(635,751.00)
NAVEUR	13,716.00	245,428.00	(231,712.00)
NAVFAC	0.00	4,385.00	(4,385.00)
NAVSEA	43,990.86	265,814.00	(221,823.14)
NAVSECGR	20,165.25	20,032.00	133.25
NAVSYSMGT	0.00	0.00	0.00
NVRESFOR	66,488.69	110,157.88	(43,669.19)
OCNR	0.00	0.00	0.00
PACFLT	2,061,732.18	2,037,301.13	24,431.05
SPAWAR	0.00	0.00	0.00
NAVY	\$5,008,730.66	\$6,543,473	(\$1,534,742.76)

Table 3, Claimant QRP Profits and Losses
() indicates negative numbers

Claimant Solid Waste Diversion Goal. The Chief of Naval Operations has directed that the DOD diversion goal be applied to the each claimant. Table 4 shows each claimant with their corresponding 2000 integrated solid waste management cost avoidance (ISWMCA) and diversion rate. To meet the goal, the ISWMCA should be positive, or neutral, and the diversion rate should be at least 40%.

Claimant	ISWMCA (\$)	Diversion (%)
BUMED	533,011.37	45.07%
CNET	786,510.84	25.60%
CNO	260,912.63	29.18%
LANTFLT	9,190,500.00	43.80%
NAVAIR	1,913,189.57	76.91%
NAVEUR	(20,287.91)	27.47%
NAVFAC	0.00	72.26%
NAVSEA	4,053,922.82	56.52%
NAVSECGR	(24,085.73)	23.11%
NAVSYSMGT	0.00	38.83%
NVRESFOR	285,564.08	28.74%
OCNR	57,941.00	19.31%
PACFLT	2,441,371.42	23.80%
SPAWAR	(24,941.80)	28.48%
NAVY	19,453,608	41.10%

Table 4, Navy Claimant Diversion Performance
() indicates negative number or loss

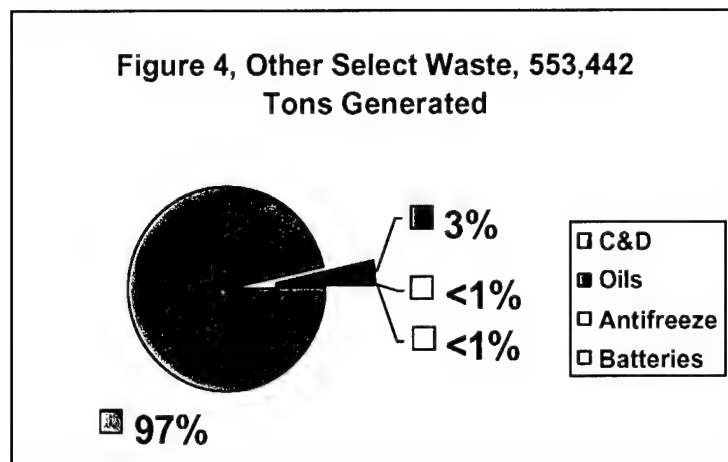
Five claimants have achieved the goal for 2000: Bureau of Medicine and Surgery, (BUMED); Commander in Chief, U.S. Atlantic Fleet (LANTFLT); Naval Air Systems Command (NAVAIR); Naval Facilities Engineering Command (NAVFAC); Naval Sea Systems Command (NAVSEA); and Commander in Chief, U.S. Pacific Fleet (PACFLT). NAVFAC, NAVSYSMGT, OCNR, and SPAWAR each have only one installation that reports solid waste. Except for NAVFAC, the claimants with a single installation performed poorly. The overall Navy diversion percentage and ISWMCA is shown at the bottom of Table 4.

Other Select Waste (OSW). Changes in Department of Defense (DOD) definitions for non-hazardous waste has allowed waste streams that may be regulated as hazardous waste OR non-hazardous solid waste--depending on state rules. For reporting purposes the following waste, hazardous or non-hazardous, will be counted with solid waste: used motor oils; waste ethylene glycol based antifreeze; and waste lead acid batteries. The Navy also moved construction and demolition waste into OSW. Table 5 shows 2000 OSW disposal, recycling, and diversion figures. OWS represents 553,442 tons of the 1,205,865 tons generated, or 46%, of the waste the Navy generates. C&D alone represent 44% of Navy generation for 2000.

Other Select Waste	Disposal (Tons)	Disposal Cost (\$)	Recycle (Tons)	Revenues (\$)	Recycling Cost (\$)	Diversion Rate (%)
C&D	213,957.76	5,646,996.25	320,576	161,727.00	604,583.49	59.97%
Oils	8,555.38	773,633.02	8,602	156,211.49	511,362.73	50.14%
Antifreeze	125.88	130,961.54	187.51	1,147.50	109,356.37	98.56%
Batteries	79.37	81,663.53	1,358	33,053.05	75,076.22	94.48%
Navy Totals	222,718.39	\$6,633,254.34	330,723	\$352,139.04	\$1,300,378.81	59.76%

Table 5, Other Select Waste

The Navy diversion rate for OSW for 2000 is 59.76%. The individual diversion rates for the waste were all respectable. The diversion rate for construction and demolition debris is a very good 59.97 %. This is significant because it comprises 97% of OSW. Figure 4 illustrates the



amount of C&D compared to the other OSW components. The diversion rate for lead acid batteries is 94.48%. Antifreeze diversion rate has increased to 98.56% from last years reported low rate of 26%. The oil diversion rate may be deceiving because if the waste oil is burned for fuel, it must be counted as disposed. Many Navy installations reported their waste oil was used for fuel or waste to energy fuel and thus must be recorded as disposed.

Construction and demolition will continue to be a challenge in waste diversion. If NAVFAC Guide Specification, (NFGS 1572), construction waste management, is used for construction and renovation jobs, the diversion rate for C&D will continue to help the Navy meet the DOD diversion rate.

Claimant Solid Waste Totals. The following tables in Section 2 show detailed claimant data for cost, revenues, tonnage for land filling, incineration, composting, recycling, and other select waste.

SECTION 2 BACKUP DATA
CY00 SOLID WASTE OPERATIONS SUMMARY
BY CLAIMANT

	Landfilled		Incinerated		Composted *		Recycled		SW + OSW	
	Tons	Cost	Tons	Cost	Tons	Cost	Tons	Cost	ISWMCA	Percent
BUMED	7,053	\$397,823	1,640	\$385,976	0	\$0	2,805	\$100,500	\$27,336	\$533,011 45%
CNET	39,234	\$2,893,791	0	\$0	1,259	\$20,000	7,041	\$489,178	\$374,406	\$786,511 26%
CNO	14,838	\$1,008,863	0	\$0	292	\$16,600	6,507	\$607,539	\$287,688	\$260,913 29%
LANTFLT	180,873	\$9,953,634	14,945	\$1,604,808	2,403	\$136,329	28,624	\$2,520,545	\$2,164,563	\$9,190,500 44%
NAVAIR	9,724	\$992,215	1,705	\$208,440	86	\$21,285	5,373	\$916,323	\$283,872	\$1,913,190 77%
NAVEUR	11,028	\$1,130,716	7	\$420	12	\$0	2,779	\$246,228	\$112,103	(\$20,288) 27%
NAVFAC	193	\$20,845	867	\$93,640	4,142	\$390,604	71	\$4,385	\$0	\$0 72%
NAVSEA	30,292	\$2,730,622	8,672	\$725,214	20	\$8,214	53,765	\$1,153,552	\$1,299,995	\$4,053,923 57%
NAVSECGR	826	\$275,307	1,813	\$226,462	13	\$1,200	927	\$59,193	\$21,846	(\$24,086) 23%
NAVSYSMGT	523	\$20,000	0	\$0	0	\$0	332	\$30,000	\$0	\$0 39%
NVRESFOR	10,416	\$620,920	758	\$61,398	3	\$0	4,484	\$125,042	\$94,731	\$285,564 29%
OCNR	1,733	\$158,505	25	\$5,146	0	\$0	404	\$26,000	\$0	\$57,941 19%
PACFLT	108,018	\$8,805,176	41,059	\$6,330,111	300	\$38,255	42,801	\$3,675,796	\$2,179,397	\$2,441,371 24%
SPAWAR	1,099	\$177,188	147	\$107,707	0	\$0	492	\$0	\$0	(\$24,942) 28%
TOTALS:	415,850	\$29,185,606	71,638	\$9,749,321	8,530	\$632,487	156,405	\$9,954,280	\$6,845,937	\$19,453,608 41%

* No composted revenues reported this year.

SECTION 2 BACKUP DATA
CY00 P2ADS SOLID WASTE INSTALLATION PROGRAMS
BY CLAIMANT

<u>QUALIFIED RECYCLING PROGRAM</u>						
	<u>SWMP</u>	<u>RCRA</u>	<u>ORP</u>	<u>Tons</u>	<u>Revenues</u>	<u>Cost</u>
BUMED	5	0	4	2,210	\$26,736.34	\$94,500.00
CNET	9	0	9	6,775	\$374,315.80	\$412,678.35
CNO	4	0	4	3,892	\$227,219.00	\$537,707.00
LANTFLT	18	4	15	23,428	\$1,893,794.54	\$1,899,147.06
NAVAIR	4	0	4	5,286	\$280,572.00	\$916,323.00
NAVEUR	5	0	4	899	\$13,716.00	\$245,428.00
NAVFAC	1	1	1	71	\$0.00	\$4,385.00
NAVSEA	11	1	7	2,044	\$43,990.86	\$265,814.00
NAVSECGR	5	0	4	144	\$20,165.25	\$20,032.00
NAVSYSMGT	0	0	0	0	\$0.00	\$0.00
NVRESFOR	5	0	5	3,635	\$66,488.69	\$110,157.88
OCNR	1	0	0	0	\$0.00	\$0.00
PACFLT	24	4	20	34,818	\$2,061,732.18	\$2,037,301.13
SPAWAR	1	0	0	0	\$0.00	\$0.00
NAVY TOTALS:	93	10	77	83,202	\$5,008,730.66	\$6,543,473.42
						(\$1,534,743)

SECTION 2 BACKUP DATA
CY00 OTHER SELECT WASTE SUMMARY
BY CLAIMANT

Waste Stream	Disposal Tons	Disposal Cost	Recycled Tons	Recycled Cost	Recycle Revenues	OSW ISWMCA	OSW % Diversion
BUMED							
Antifreeze	1.73	\$345	0.94	\$0	\$0		
C&D	14,563.00	\$233,096	16,251.00	\$75,413	\$0		
Lead-Acid Batteries	2.02	\$3,220	8.96	\$0	\$41		
Oils	0.40	\$275	15.52	\$0	\$0		
BUMED Totals	14,567.15	\$236,936	16,276.42	\$75,413	\$41	\$484,819	52.77%

CNET							
Antifreeze	10.96	\$10,900	12.00	\$5,000	\$0		
C&D	6,246.60	\$225,919	7,155.00	\$0	\$0		
Lead-Acid Batteries	0.40	\$407	16.75	\$1,425	\$670		
Oils	73.60	\$1,083	191.37	\$3,204	\$4,640		
CNET Totals	6,331.56	\$238,309	7,375.12	\$9,629	\$5,310	\$557,509	53.81%

CNO							
Antifreeze	7.41	\$690	7.60	\$0	\$0		
C&D	14,316.41	\$798,735	4,977.20	\$72,320	\$114,064		
Lead-Acid Batteries	0.00	\$0	50.12	\$3,269	\$2,318		
Oils	24.00	\$179	189.63	\$116,413	\$451		
CNO Totals	14,347.82	\$799,604	5,224.55	\$192,002	\$116,833	\$248,607	26.69%

**SECTION 2 BACKUP DATA
CY00 OTHER SELECT WASTE SUMMARY
BY CLAIMANT**

Waste Stream	Disposal Tons	Disposal Cost	Recycled Tons	Recycled Cost	Recycle Revenues	OSW ISWMCA	OSW % Diversion
LANTFLT							
Antifreeze	32.96	\$63,256	66.50	\$34,145	\$0		
C&D	53,807.54	\$684,094	166,173.91	\$96,263	\$10,000		
Lead-Acid Batteries	0.57	\$960	735.71	\$6,344	\$22,107		
Oils	7,519.11	\$526,742	2,079.76	\$54,335	\$36,356		
LANTFLT Totals	61,360.18	\$1,275,054	169,055.88	\$191,087	\$68,463	\$8,420,712	73.37%
NAVAIR							
Antifreeze	4.11	\$4,354	0.17	\$0	\$0		
C&D	13,662.40	\$408,249	77,923.75	\$26,684	\$0		
Lead-Acid Batteries	5.00	\$4,861	29.05	\$0	\$224		
Oils	1.89	\$21,613	190.00	\$11,014	\$820		
NAVAIR Totals	13,673.40	\$439,077	78,142.97	\$37,698	\$1,044	\$2,329,118	85.11%
NAVEUR							
Antifreeze	17.98	\$12,855	1.10	\$450	\$0		
C&D	810.00	\$58,800	1,472.60	\$5,221	\$0		
Lead-Acid Batteries	0.00	\$0	68.09	\$250	\$0		
Oils	7.10	\$900	162.83	\$54	\$1,310		
NAVEUR Totals	835.08	\$72,555	1,704.62	\$5,975	\$1,310	\$42,382	67.12%

**SECTION 2 BACKUP DATA
CY00 OTHER SELECT WASTE SUMMARY
BY CLAIMANT**

Waste Stream	Disposal Tons	Disposal Cost	Recycled Tons	Recycled Cost	Recycle Revenues	OSW ISWMCA	OSW % Diversion
NAVFAC							
Antifreeze	0.00	\$0	3.00	\$4,237	\$0		
C&D	601.00	\$16,349	0.20	\$100	\$0		
Lead-Acid Batteries	1.00	\$17	10.00	\$1,614	\$0		
Oils	2.00	\$4,527	108.00	\$31,824	\$28		
NAVFAC Totals	604.00	\$20,893	121.20	\$37,775	\$28	(\$27,486)	16.71%

NAVSEA							
Antifreeze	20.60	\$15,325	7.00	\$4,392	\$0		
C&D	16,977.95	\$278,833	16,619.64	\$57,383	\$31,334		
Lead-Acid Batteries	3.69	\$5,489	161.33	\$4,588	\$3,667		
Oils	336.94	\$96,279	2,604.19	\$45,389	\$102,308		
NAVSEA Totals	17,339.18	\$395,926	19,392.17	\$111,752	\$137,309	\$1,066,190	52.79%

NAVSECGR							
Antifreeze	2.36	\$1,887	1.96	\$2,800	\$1,148		
C&D	1,045.63	\$583,015	152.00	\$7,500	\$0		
Lead-Acid Batteries	19.00	\$38,000	6.83	\$10,000	\$112		
Oils	11.23	\$4,215	16.22	\$19,808	\$0		
NAVSECGR Totals	1,078.22	\$627,117	177.01	\$40,108	\$1,260	(\$75,814)	14.10%

SECTION 2 BACKUP DATA
CY00 OTHER SELECT WASTE SUMMARY
BY CLAIMANT

Waste Stream	Disposal Tons	Disposal Cost	Recycled Tons	Recycled Cost	Recycle Revenues	OSW ISWMCA	OSW % Diversion
NAVSUP							
C&D	711.15	\$37,622	891.55	\$12,736	\$0		
Lead-Acid Batteries	0.00	\$0	13.80	\$0	\$0		
Oils	0.00	\$0	1.50	\$0	\$0		
NAVSUP Totals	711.15	\$37,622	906.85	\$12,736	\$0	\$33,967	56.05%
NVRESFOR							
Antifreeze	0.90	\$486	7.18	\$5,592	\$0		
C&D	1,790.00	\$28,000	467.97	\$408	\$0		
Lead-Acid Batteries	0.00	\$0	17.99	\$0	\$754		
Oils	0.00	\$0	248.28	\$23,250	\$2,978		
NVRESFOR Totals	1,790.90	\$28,486	741.42	\$29,250	\$3,732	\$15,421	29.28%
OCNR							
Antifreeze	0.00	\$0	3.20	\$0	\$0		
Lead-Acid Batteries	0.00	\$0	4.60	\$0	\$0		
Oils	0.00	\$0	8.80	\$179	\$0		
OCNR Totals	0.00	\$0	16.60	\$179	\$0	\$3,141	100.00%

**SECTION 2 BACKUP DATA
CY00 OTHER SELECT WASTE SUMMARY
BY CLAIMANT**

Waste Stream	Disposal Tons	Disposal Cost	Recycled Tons	Recycled Cost	Recycle Revenues	OSW ISWMCA	OSW % Diversion
PACFLT							
Antifreeze	26.67	\$19,817	76.86	\$52,740	\$0		
C&D	89,426.08	\$2,294,285	28,491.05	\$250,556	\$6,329		
Lead-Acid Batteries	47.39	\$27,310	232.11	\$47,586	\$3,159		
Oils	579.11	\$117,819	2,784.21	\$205,893	\$7,321		
PACFLT Totals	90,079.26	\$2,459,231	31,584.23	\$556,775	\$16,809	\$1,651,908	25.96%

SPAWAR							
Antifreeze	0.20	\$1,046	0.00	\$0	\$0		
Lead-Acid Batteries	0.30	\$1,398	2.50	\$0	\$0		
Oils	0.00	\$0	1.90	\$0	\$0		
SPAWAR Totals	0.50	\$2,444	4.40	\$0	\$0	\$145	89.80%

NAVY Totals: 222,718.39 \$6,633,254 330,723.43 \$1,300,379 \$352,139 \$14,750,619 59.76%

CY 2000
POLLUTION PREVENTION ANNUAL DATA SUMMARY (P2ADS)
HAZARDOUS WASTE SUCCESS STORIES

CHIEF OF NAVAL EDUCATION AND TRAINING

NAVAL AIR STATION MERIDIAN, MS

1. Success Description: Converted all printing operations to dry systems.

Economic Benefits: Eliminated the procurement of wet chemicals at about \$2,700 per year. Cannot estimate net savings on material procurement because the cost of toners is part of a maintenance contract. Eliminated approximately 50 pounds of printing waste that resulted in an annual savings of approximately \$30.

P2 Environmental Benefits: Eliminated all printing wastes. All toner cartridges are reused or recycled. Eliminates toxic wet print chemicals and already minimized wastes from wet printing operations.

Other Benefits: Eliminated large stores of toxic printing chemicals; reduced health hazards to operators; and the potential for a release into the environment.

POC Name: Gloria Mattingly

Commercial: 601-679-2918

Code: 18911

Fax: 601-679-2990

Email: gloria.mattingly@cnet.navy.mil

2. Success Description: Fluorescent lamps. Replaced lamps in buildings across the base with low-energy, low-mercury lamps. Using low-mercury lamps in remaining "old" four-foot fixtures. Handling all high-mercury lamps as universal wastes.

Economic Benefits: Compared to CY99 we saved \$2,430 in disposal costs in CY00 and estimated procurements saving of \$3,920.

P2 Environmental Benefits: The first project significantly reduced the annual amount of used fluorescent lamps, reducing both material and disposal costs. Only 1,315 pounds sent to recycling in CY00 compared to 4,031 pounds in CY99. Projects 1 and 2 take us out of the hazardous and universal waste business for fluorescent lamps and Project 3 takes us out of the hazardous waste arena.

Other Benefits: Projected annual BTU savings from the relamping project are 11,993 MBTU, with an annual cost savings of \$210,713.

POC Name: Gloria Mattingly

3. Success Description: Using aircraft cleaner in portable totes rather than in drums.

Economic Benefits: Based on current workload, projected savings are: \$1,900 on the cost of soap, plus labor time will be cut by two hours per day approximately \$13,000. At this point, only one contractor is using this option, reducing those saving by about 60%.

P2 Environmental Benefits: Eliminates the need to store and handle heavy drums; reduces risks of spills; and eliminates large numbers of empty drums.

POC Name: Gloria Mattingly

CHIEF OF NAVAL EDUCATION AND TRAINING

NAVAL AIR STATION MERIDIAN, MS (continued)

4. Success Description: Dry cleaning and reusing maintenance rags rather than rag disposal.

Economic Benefits: None. Costs for leasing dry cleaning are about the same as for procurement and disposal.

P2 Environmental Benefits: This initiative eliminates almost all rags soiled with petroleum from going to landfill. This, in turn, removes environmental liability for these rags. Some hazardous waste rags, as allowed under Mississippi regulations, are also included in the dry cleaning program. Using dry cleaning, rather than laundry, results in a minimally contained waste stream from the cleaning process.

POC Name: Gloria Mattingly

5. Success Description: Material/process substitutions including: escalating use of water-borne plants, including water-borne traffic plants; change to a non-ethylene glycol de-icing fluid; and use of oxygen-cleaning equipment that substantially reduced the need for 1,1,1 trich.

Economic Benefits: Minimal.

P2 Environmental Benefits: Reduced toxic exposure to workers and releases to the environment, especially to the air.

POC Name: Gloria Mattingly

CHIEF OF NAVAL OPERATIONS

ADMINISTRATIVE SUPPORT UNIT SOUTHWEST ASIA

6. Success Description: Reduced shipboard hazardous waste disposal cost and quantity by over 70%. Received over 100 tons of shipboard hazardous waste. Converted 18 tons to solid waste through filter drainage and crushing, light bulb crushing, and aerosol can puncturing. Recycled over 69 tons of used oil and dirty rags. HW disposal quantity was reduced to about 18 tons.

Economic Benefits: Reduced disposal cost by over \$300,000 and reduced the need to purchase new rags.

P2 Environmental Benefits: Diverted over 82 tons from the hazardous waste landfill. Over 69 tons were recycled and reused.

Other Benefits: Gained the admiration and appreciation of the host nation.

POC Name: Awni M. Almasri

Commercial: 011-973-724-60

Fax: 011-973-743-02 Email: almasria@nsa.bahrain.navy.mil

CHIEF OF NAVAL OPERATIONS

NAVAL DISTRICT WASHINGTON

7. Success Description: Increased use of HAZMIN center to issue hazardous material and using more "environmental friendly" products.

Economic Benefits: Reduced hazardous waste disposal cost (excluding lead abatement projects) and reduced amounts of hazardous material purchased.

P2 Environmental Benefits: Reduced number of waste streams.

POC Name: Steven Godio

Commercial: 202-433-7192

Code: N21

Fax: 202-433-6831

Email: steven.godio@ndw.navy.mil

NAVAL SUPPORT ACTIVITY MONTEREY BAY, CA

8. Success Description: Continued recycling 80% of all hazardous waste and reutilization of hazardous materials.

P2 Environmental Benefits: Navy savings due to reutilization.

POC Name: Al Heinetz

Commercial: 831-656-2841

Code: 2314

Fax: 831-656-3656

Email: aheinetz@nps.navy.mil

COMMANDER IN CHIEF, U.S. ATLANTIC FLEET

NAVAL AIR STATION OCEANA, VIRGINIA BEACH, VA

9. Success Description: By using digital processing equipment procured by the Pollution Prevention Equipment Program (PPEP), the Photo Lab at Naval Air Station Oceana is now 75% chemical free.

Economic Benefits: This process change saves \$63,416 per year by reducing or eliminating 120 and 35mm film; negative image printing; prints reproduction; hazardous waste disposal; silver sludge handling; and wastewater pretreatment.

P2 Environmental Benefits: NAS Oceana Photo Labs generated 75% less waste.

POC Name: Joseph A. Vlcek

Commercial: 757-444-3009

Code: 940

Fax: 757-444-3000

Email: vlcekja@pwcnorva.navy.mil

NAVAL AIR STATION KEFLAVIK, ICELAND

10. Success Description: As the result of NAS Keflavik receiving a Glyclean Antifreeze Recycler, the NAS Keflavik Environmental Division has begun recycling used antifreeze. The process was set up in an available space and required no additional site preparation.

COMMANDER IN CHIEF, U.S. ATLANTIC FLEET

NAVAL AIR STATION KEFLAVIK, ICELAND (continued)

Economic Benefits: Used glycol recycling has resulted in significant cost savings in both hazardous waste disposal and new product procurement. The net savings are \$541 per 55-gallon drum. The station will typically see a \$5,000-\$10,000 cost savings in a year.

P2 Environmental Benefits: The use of glycol recycling has resulted in reduced hazardous waste. The station is now able to use recycled antifreeze in situations that normally would have required new product. This eliminates the need to order and have in stock large quantities of virgin product.

POC Name: Johanna Turner

Commercial: 011-354-425-77 **Code:** 60E4

Fax: 011-354-425-29 **Email:** johanna.turner@nadkef.navy.mil

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MS

11. Success Description: CBC Gulfport has installed an automated small arms aqueous cleaner. This unit will be used by the armory staff for cleaning stored weapons. This unit can clean sixteen M16s, twenty 9mm/45 caliber pistols, and six M60 machine guns. The total wash, rinse, and dry cycle for cleaning these weapons is 12 minutes.

Economic Benefits: This machine has taken the place of additional personnel and can clean weapons better. Thus, we can maximize our small staff and comply with the requirements to maintain all stored weapons in proper working condition.

P2 Environmental Benefits: This machine has eliminated 75% of the hazardous materials used in cleaning weapons. It has also cut the use of CLP by 50%, since this material is now used mainly as a lubricant and preservative.

Other Benefits: Use of this machine should help extend the life of the weapons, since they will be completely cleaned and lubricated.

POC Name: Gary Broom

Commercial: 228-871-3228 **Code:** 410

Fax: 228-871-3116 **Email:** gwbroom@cbcgulf.navy.mil

NAVAL STATION PASCAGOULA, MS

12. Success Description: The station has reduced its hazardous waste generation by 10%. This success is due to better material use by maintenance facilities and the exclusive use of CHRIMP.

Economic Benefits: Activities using CHRIMP are better able to manage materials (paints, solvents, and corrosion control material) used in their processes. The benefits are a 10% reduction of material being disposed.

P2 Environmental Benefits: CHRIMP helps us reduce the amount of hazardous materials that are disposed as hazardous waste.

COMMANDER IN CHIEF, U.S. ATLANTIC FLEET

NAVAL STATION PASCAGOULA, MS (continued)

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NAVAL SUPPORT STATION MECHANICSBURG, PA

13. Success Description: Replaced all parts washers provided by Safety Kleen with government owned machines that clean solvents at the source.

P2 Environmental Benefits: Volume of solvents being transported via public highways almost eliminated. Solvent disposal almost eliminated.

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NAVAL WEAPONS STATION EARLE, COLTS NECK, NJ

14. Success Description: In CY 2000 there were 213,704 pounds of hazardous waste collected and disposed from home ported ships, as opposed to 84,937 pounds in CY 1999. However, the cost of disposing of shipboard generated hazardous waste increased by only \$85,506.

Economic Benefits: Shipboard hazardous waste disposal costs in CY 2000 equaled \$166,295. In CY 1999 the total cost was \$80,789. This was an overall decrease in unit cost from 95 cents per pound to 78 cents per pound.

P2 Environmental Benefits: Various home ported and visiting ships offloaded 213,704 pounds of hazardous waste over the course of a year. This waste was transported from the pier to the hazardous storage facility located 18 miles across the station. In spite of the large volumes of waste collected and transported over a considerable distance, there were no spills, mishaps, or injuries.

Other Benefits: A more proactive approach to the packaging of hazardous waste has accounted for the lower unit costs for hazardous waste disposal. Methods such as pouring, combining, and over packing of compatible hazardous waste classes has led to a more economically beneficial disposal cost.

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NAVAL AIR SYSTEMS COMMAND

NAVAL AIR ENGINEERING STATION LAKEHURST, NJ

15. Success Description: CHRIMP continues to reduce the amounts of hazardous materials in the shop areas. Lakehurst continues to reduce the amounts of hazardous materials ordered by checking material requests and using cost avoided materials when feasible. A total of \$2,242.28 worth of hazardous material requests were disapproved when it was brought to the customer's attention that the material was already available in stock.

Economic Benefits: Seven thousand eight hundred ninety-four dollars worth of hazardous materials were issued from cost avoidance at no charge to the customer. These issues prevented \$1,921 of hazardous waste/material disposal cost for a total savings of \$9,816. By recycling and reusing old, spent, anhydrous ammonia cylinders, the base saved \$12,250 in hazardous waste disposal costs for this item in CY 2000. By recycling a solvent onsite, the base saved \$230 in disposal costs and \$2,200 in new purchase costs.

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Code: 8.2

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NAVAL AIR WARFARE CENTER WEAPONS DIVISION CHINA LAKE, CA

16. Success Description: Procedural changes at the hazardous waste storage facility. Due to the size of China Lake, 1.1 million acres, and the extreme distance between many of the 60 hazardous waste accumulation areas, China Lake holds a Part B permit for hazardous waste storage up to one year. Because of China Lake's RDT&E mission, all types of hazardous waste are stored at the facility. Recently, our storage facility personnel assumed the responsibility of modernizing waste handling procedures at the facility. The main focus of this modernization process was preparation of a database to track waste from its generation to its final disposition. Off-the-shelf databases were evaluated for China Lake specific functions. However, due to the wide variety of government required forms, "canned" databases were eliminated as an option due to lack of funding. Therefore, storage facility personnel prepared the database. The database completes all paperwork for waste handling procedures at the facility. Once the waste is transferred to the facility from the generator area, waste information is entered into the database. Hazardous waste labels are generated from this information and placed on the waste container. For tracking purposes, each container has a unique identification number. If a waste is lab packed or bulked with other wastes, the new container is tracked with a new identification number. Waste profiles are also included in the database for easy reference. In addition, order forms and manifests for offsite transportation to the disposal facility are generated in minutes. Wastes can be tracked by generator, contract delivery order number, manifest number, storage time limit, and a variety of other sorting factors. In addition, costs for transportation and disposal are easily tabulated, while EPA and Navy report forms are effortlessly completed.

Economic Benefits: Use of the tracking database has provided the opportunity to accomplish the following:

1. Save time and consequently funds. Prior to implementation of the database, 10 waste

NAVAL AIR SYSTEMS COMMAND

NAVAL AIR WARFARE CENTER WEAPONS DIVISION CHINA LAKE, CA

(continued)

handling documents (e.g., order forms) were prepared per day. The database allows for preparation of one document per minute. Elimination of these repetitive steps has allowed for a once understaffed facility to function at a reasonable pace.

2. Reduce the likelihood of fineable violations. Because the database easily tracks all aspects of the waste from its generation to its final disposition, human errors, such as simple typographical errors are virtually eliminated. Consequently, this improvement minimizes potential violations that can involve fines and numerous labor hours responding to follow-up requirements.

3. Reduce disposal costs. The database allows for easy access to waste profile information. A recent review of the waste profile procedures generated additional cost savings via waste consolidation. For example, paints, solvents, and mixed flammable wastes that were traditionally lab packed are now decanted into 55-gallon drums at a cost saving of \$68,000 per year. An additional example involves CA-only wastes. These wastes, which were traditionally containerized, are now placed in a bin at a cost saving of \$7,000 per year.

POC Name: Laurie Zellmer

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17. Success Description: Reworking of the Human Health Risk Assessment for Treatment of Energetic Wastes by Open Detonation. In the early 1990's work was performed to fulfill regulatory requirements for a permit application to treat energetic wastes by Open Burn/Open Detonation (OB/OD) at China Lake's OB/OD Facility. At that time, insufficient data describing the emissions from OB/OD existed. As directed by the regulatory agencies, extremely conservative assumptions were used to perform a human Health Risk Assessment (HRA) for potential adverse impacts to humans from emissions from OB/OD treatment events. The results of that HRA and associated treatment limits were documented and approved by State of California regulatory agencies in 1996. Since preparation of the 1996 HRA, additional research and development has resulted in new data and improved methodologies. Based on these new data and findings, the 1996 HRA was re-evaluated by scientists and environmental specialists at China Lake. This technical re-evaluation determined that:

- The newly available data either refutes some of the earlier assumptions used in the 1996 HRA and/or should be used in place of those assumptions, providing more realistic analysis of actual health risks; and
- The assumptions of primary concern are:
 - 1.1 grams of metal case with a fixed composition were assumed to be present for every gram of explosive treated.
 - 100% of this metal case was assumed to: vaporize, continue to exist as a vapor (as opposed to being oxidized), be transported to the China Lake fence line as a vapor, and be inhaled or ingested by human receptors as the metal vapor.
 - Emissions from OD treatment of explosive-contaminated waste were characterized using data from a medical waste incinerator. In addition, 15% of the emissions were assumed to be products of incomplete combustion (PICs).

NAVAL AIR SYSTEMS COMMAND

NAVAL AIR WARFARE CENTER WEAPONS DIVISION CHINA LAKE, CA (continued)

- The volume of dust cloud was used as the reaction volume.

P2 Environmental Benefits: To correct deficiencies of the 1996 HRA, China Lake has proposed interim and long-term approaches to the regulatory agencies. The new approaches do not rely on the now non-credible assumptions, relying instead on validated, experimentally determined emission factors. A revised HRA based on the proposed approaches provide the following benefits:

- Withstand public scrutiny.
- Increase the annual and event treatment limits by orders of magnitude, but stay within approved health risks.
- Can be applied to other DOD installations with OB/OD facilities.

POC Name: Laurie Zellmer

18. Success Description: Tactical Demilitarization Development Program.

The Tactical Demilitarization Development Program (TaDD) was established to develop an alternative treatment technology to demilitarize Shillelagh motors in an environmentally acceptable manner. The propulsion system of the Shillelagh contains approximately 11 pounds of propellants. Due to the presence of burn-rate modifiers containing lead in the propellants, OD of these units is undesirable, and alternate disposal techniques were established. Additionally, the missiles contain sufficient quantities of precious metals that warrant developing a method for removing the propellant from the missiles while leaving the carcass intact for resource recovery and recycling (R3). The chosen alternative technology burns Shillelagh tactical motors in a process that oxidizes carbon monoxide and hydrogen and collects combustion particulates. The initial development phase of the TaDD program was completed in February 1998 at Naval Air Warfare Center Weapons Division (NAWCWD) China Lake. This effort resulted in the creation of a transportable facility to demilitarize the Shillelagh missile (without a warhead) in a firing chamber equipped with a stepped nozzle. During main grain combustion, the under-oxidized combustion gases are turbulently mixed via the stepped nozzle with air inside a large containment vessel and burned. The gas generator combustion has a much reduced mass-flow rate, and the stepped nozzle will not produce the required turbulence for complete mixing with air inside the chamber. As a result, a stoichiometric amount of air is injected into the firing chamber during gas generator combustion. Injected air when coupled with active ignition systems ensures secondary combustion of the gas generator products. The hot gases and particulate generated during the combustion process are completely contained within the system's gas holder. The gas holder is a 5,400 cubic-foot containment vessel, which operates at a peak pressure of 9 psig, and a maximum temperature of less than 250 degrees Celsius. The gases are subsequently cooled and routed through a treatment facility to remove the lead particulate. Results indicate that the lead particulate is removed below the detection limit of the analytical procedures employed and that the hydrogen and carbon monoxide levels have been reduced below 5% of their respective lower flammability limits. Results indicate that heavy metal emissions are drastically below their Environmental Protection Agency action levels. The new technology is applicable to any missile system with propellants containing heavy metal burn

NAVAL AIR SYSTEMS COMMAND

NAVAL AIR WARFARE CENTER WEAPONS DIVISION CHINA LAKE, CA

(continued)

rate modifiers. Data obtained from this phase of the TaDD program are being used for the design of the next phase of the TaDD program; a prototype facility to be installed at the Nevada test site, north of Las Vegas. The prototype facility will undergo validation testing, which will include testing an automated feed mechanism for rocket motors. Prototype testing will prove additional data necessary for the design of a full-scale facility to be transitioned into an Industrial Operations Command facility in FY 2000. Contained burn technology is currently being pursued for use as an affordable, environmentally compliant, contained static test capability for propulsion system characterization. The primary test is in applying this technology to routine static fire testing.

POC Name: Laurie Zellmer

19. Success Description: Pollution prevention in photographic processing continues. When you produce a better product, that's good. When you also produce it faster, that's better yet. And when you produce that better product faster and at the same time cut pollution and waste by half, then you're really doing something special. In the Technical Information Division's Photo Lab at Naval Air Warfare Center (NAWC) China Lake, California, they're doing something special: better pictures faster and with less pollution and waste, courtesy of the Navy's Pollution Prevention (P2) Program. In 1996, NAWC submitted an application for the P2 Program to CNO (N45). Numerous data calls followed in which the Photo Lab was required to explain to N45, as well as pollution experts from several Navy activities, just how the requested digital technology would reduce pollution. Hard work and careful research paid off. In late 1996, the Photo Lab was approved for \$225,000 worth of equipment to begin the massive digital transition. An equipment list was submitted, processed, and procured. The equipment was in place and operational in 1997. Its performance has exceeded the initial expectations. Many functions went digital, and new capabilities were added: digital viewgraphs, a scanning process that eliminated the need for screen prints, and digital posters that reduced the need for pollution-intensive traditional prints. The latest additions to the original equipment are a Noritsu 2301 printer/processor and the Mega Vision S3 digital camera-back from the lab's traditional medium-format cameras delivered in 1999.

P2 Environmental Benefits: The new equipment reduces pollution in two ways. First, the Noritsu, a hybrid printer/processor created in conjunction with Kodak, uses a new no-mix photochemistry that is cleaner, faster and dramatically reduces effluents and waste. Paper use alone is down to 15 boxes per month. That's a 50% reduction. Chemical use is down at least as much, and water use is insignificant. The Noritsu also saves time by eliminating the need for chores associated with chemical mixing, storage, cleaning spills, and container disposal. Second, the new S3 camera-back interfaces with a G3 computer in the studio, or a G3 powerbook in the field. Customers now view the photographer's image in real time and can work with the photographer right on the spot to make sure the photo is exactly what is needed. The image can then be e-mailed immediately or prints can be made on the Noritsu. The live-preview process eliminates film processing and contact sheet printing.

POC Name: Laurie Zellmer

NAVAL AIR SYSTEMS COMMAND

NAVAL AIR WARFARE CENTER WEAPONS DIVISION CHINA LAKE, CA (continued)

20. Success Description: Basewide Hydrogeologic Characterization Study Evaluates Groundwater. A basewide Hydrogeologic Characterization Study has been underway to give a picture of the groundwater under China Lake and the city of Ridgecrest. The work is being done under a Comprehensive Long-term Environmental Action Navy (CLEAN) contract. The goal of the study is to produce a three-dimensional underground mapping of the water sources; determine where the water is flowing, and predict water migration trends. Hydrogeology is the study of groundwater and how it is influenced by the surrounding geology. By understanding the hydrogeology of the area, China Lake's impact on the groundwater can be better understood. The information will help determine whether the resource has been contaminated to the point that it could be hazardous to human health or the environment. One of the benefits of the study will be to help to establish priorities since protecting the drinking water is the community's main concern. China Lake is trying to ascertain if there will be a problem at the Installation Restoration Program (IRP) sites. The purpose of the Navy IRP is to identify, assess, characterize; and clean up or control contamination from past hazardous waste disposal operations and hazardous material spills. The study will give China Lake a better understanding of any hydrogeologic interaction between the IRP sites, mostly located in the shallow aquifer, and the valley's water supply that is pumped from the deep aquifer, and the valley's water supply which is pumped from the deep aquifer.

POC Name: Laurie Zellmer

21. Success Description: Installation Restoration Plan at Site 47 continues.

A cleanup plan for the Michelson Lab industrial sewer system and its two evaporative treatment ponds is under study. The cleanup area is referred to as Site 47 under the Installation Restoration Plan, a Department of Defense initiative to identify, evaluate and clean up former hazardous waste substance disposal sites. The cleanup plan, called an Engineering Evaluation/Cost Analysis, describes the site's background, cleanup objectives, and removal action alternatives. The report also identifies and explains the preferred removal action alternatives for the site. The Department of Toxic Substances Control, in compliance with the California Environmental Quality Act, has reviewed the proposed activities for the site and determined that the removal actions does not have potential for an adverse effect on public health or the environment. Therefore, DTSC proposes to exempt this project from the requirements of the California Environmental Quality Act.

POC Name: Laurie Zellmer

NAVAL AIR SYSTEMS COMMAND

NAVAL AIR WARFARE CENTER WEAPONS DIVISION CHINA LAKE, CA

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22. Success Description: NAWCWD China Lake supports development of aqueous test protocol. The Chief of Naval Operations (N451) initiated a Pollution Prevention Equipment Program (PPEP) pre-production project, supported by NAVAIR and NFESC, to develop an aqueous cleaning test protocol for fixed and rotor wing aircraft guns. The test protocol will be used to evaluate and demonstrate aqueous-based cleaning systems as an alternative to solvent-based cleaners, such as PD-680. The San Joaquin valley Unified Air Pollution Control District (SJVAPCD) has proposed a modification to their solvent-degreasing rule number 4662. The proposed rule limits solvent VOC content to 50 gm/l or require airtight cleaning systems or emission control equipment. This rule will effectively prohibit the use of PD-680 in SJVAPCD. Compliance with the 50gm/l VOC limit is expected by January 2002. The lower VOC limit will affect Aircraft Intermediate Maintenance Department (AIMD) maintenance operations in California. Under the proposed rule, PD-680 will no longer be allowed for use in solvent degreasing operations. If a substitute material or process is not authorized, the AIMD will not be able to perform specific maintenance requirements in accordance with NAVAIR technical manuals. Phase I of this project, initiated in FY99, resulted in the development of an U.S. Navy/Marine Corps Aqueous Weapons Cleaner Test Protocol. There are over 40 separate tests identified in the protocol to determine the effectiveness and reliability of replacing petroleum-based solvents with aqueous systems. The aqueous-based cleaners identified for Phase II of this project include dry steam, enclosed aqueous parts washers, and bacteria-based systems. These systems were selected because they satisfy the 50mg/l VOC limit content. One of these systems is being used for similar applications by the Air Force and aqueous cleaning systems procured by PPEP have been very successful as a replacement for non-critical petroleum solvent equipment cleaning. The anticipated completion date for Phase II is early 2001.

POC Name: Laurie Zellmer

23. Success Description: Chlorine gas (Cl₂) elimination. The old process by which well water and swimming pool water was treated with chlorine gas (Cl₂), has been replaced with an automated system that treats the water, by injection, with sodium hypochlorite solution. This new treatment process eliminates the storage, handling, and use of from 1,700-6,000 pounds of chlorine gas per year, depending upon the ambient temperature and water consumption. As we convert the remaining water wells we will be able to eliminate more chlorine gas. The closure of the gas cylinder yard of the supply department eliminates the storage of tens of thousands of pounds of hazardous substances. The end users now purchase the quantity they require when they need it. This drastically reduces the amount of hazardous substances aboard China Lake.

POC Name: Laurie Zellmer

COMMANDER IN CHIEF, U.S. NAVAL FORCES EUROPE

NAVAL ACTIVITIES UNITED KINGDOM LONDON, UK

24. Success Description: Diverted 14,856 pounds of hazardous waste away from landfill/incineration by ensuring that companies who collect hazardous waste will recycle or reuse all substances/materials.

Economic Benefits: Saving on incineration and landfill fees.

P2 Environmental Benefits: Public awareness is the command's prime concern. Hazardous waste will be recycled or reused by licensed companies who specialize in hazardous waste recovery operations. By ensuring the command's hazardous waste is recycled or reused, we are helping to keep a cleaner environment.

Other Benefits: More involvement by command personnel has led to the increase in hazardous waste recycling.

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NAVAL AIR STATION SIGONELLA, ITALY

25. Success Description: Cost avoidance for disposal of fuel as hazardous waste.

Economic Benefits: NAS Sigonella saved \$126,384 in disposal costs by burning recovered fuel in its boilers for energy recovery.

POC Name: Jane Beason

Commercial: 39-095-86-5630 **Email:** jwbeason@nassig.sicily.navy.mil

26. Success Description: An oil filter crusher was installed at the public works vehicle shop. Since the filters are placed in drums for disposal, by reducing the volume, the disposal cost is also reduced.

Economic Benefits: Disposal cost was reduced by 22%.

POC Name: Myrna Martinez

Commercial: 39-095-86-5630

Fax: 39-095-86-5587 **Email:** mmartine@nassig.sicily.navy.mil

27. Success Description: A paint mixing machine was installed at the HAZMIN center. This machine mixes a wide variety of colors of latex paints in quantities ranging from one pint to five gallons.

P2 Environmental Benefits: By mixing paint to order, the need to stock a variety of colors is avoided and paint waste is minimized.

POC Name: Myrna Martinez

COMMANDER IN CHIEF, U.S. NAVAL FORCES EUROPE

NAVAL AIR STATION SIGONELLA, ITALY (continued)

28. Success Description: Implementation of CHRIMP and reissuing hazardous material.

Economic Benefits: Saved \$15,275.78.

POC Name: Jane Beason

NAVAL STATION ROTA, SPAIN

29. Success Description: In the past, Naval Station Rota and Moron AB Spain disposed of used oil and fuel as hazardous waste. This was the only option because Spain did not have information on recyclers for this commodity. With aggressive sales tactics from DRMO, Public Works Environmental, and the International Sales Office located in Wiesbaden Germany, a local customer was found.

Economic Benefits: On a regular basis, the sales contractor pumps out the product from the generator's drums. The generators need not buy new drums, they reuse the previous ones used to collect the recyclables. Naval Station Rota and Moron AB disposal cost avoidance for FY99 was \$41,716.

P2 Environmental Benefits: The used oil/fuel is blended and used in applications such as energy for boiler heating systems and cement kilns. Prior to recycling, these products were disposed of by incineration via service contract. These two waste streams were eliminated, since they are now being sold/recycled and handled as hazardous material. Fewer natural resources are being used and we're saving money too. A total of 89,724 kgs of oil and 50,377 kgs of fuel were removed during FY99.

POC Name: Carl Sirois

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30. Success Description: Naval Station Rota's Fuels Division had approximately 1,010,644 liters of contaminated bilge oil in a tank awaiting disposal. They approached the DRMO to inquire if this product could be sold versus disposal as was done in the past. An analysis was taken on oil/water mixture and with a team effort from the host environmental office, DRMO, and the International Sales Office, an invitation for bid was sent out and awarded to a local customer.

Economic Benefits: The Fuels Division, a branch of the Defense Logistics Agency, did not have to budget to dispose of this bilge fuel/oil as a hazardous waste. After many tractor-tanker loads were removed by the sales contractor, a cost avoidance for disposal of \$334,382.00 was achieved. Contract work to clean/repaint the containment tank was resumed.

P2 Environmental Benefits: An estimated weight of 808,515 kilograms was eliminated from disposal via incineration and used as fuel in cement kilns and a local cannery.

POC Name: Carl Sirois

COMMANDER IN CHIEF, U.S. NAVAL FORCES EUROPE

NAVAL STATION ROTA, SPAIN (continued)

31. Successful Description: Used automotive type lead acid batteries were being disposed of as a hazardous waste. The same problem existed--no information was available on a potential recycler for this waste stream. Generators were draining the acid from the batteries. The acid was turned in and the empty spent batteries were turned in—resulting in two waste streams.

Economic Benefits: Drained and undrained lead acid batteries are now sold to a recycler for the lead and copper content. This eliminated two waste streams and the potential for an accidental spill or personnel injury from the acid. A cost avoidance for disposal of \$21,067 in FY99 was attained with 46,779 kilograms recycled. This effort has saved a great number of labor hours and was the first ever recycling sale at Naval Station Rota.

P2 Environmental Benefits: Hazardous waste from draining the batteries was eliminated and lead/copper components of the batteries is recycled rather than disposed in a landfill or treatment facility. Generators are enthusiastic about recycling, which reduces their hazardous waste budget. They can now redistribute funds into upgrades such as computers, furniture, and vehicles to better support the mission.

POC Name: Carl Sirois

32. Success Description: Non-PCB transformers, less than 50 ppm, were being disposed of as a hazardous waste. Large quantities generated at the naval station impacted DRMO's storage area. Rather than reverting to a service contractor for disposal, the sales and compliance teams certified a buyer from Spain. These transformers are now sold as one-time national sales as they are generated.

Economic Benefits: Naval Station Rota achieved a disposal cost avoidance of \$32,743 and 33,940 kilograms were sold/recycled in FY99 versus disposal via service contract.

P2 Environmental Benefits: The transformers are being broken down to retrieve the high copper content of the core windings and nucleus.

POC Name: Carl Sirois

NAVAL SUPPORT ACTIVITY DET CAPODICHINO NAPLES, ITALY

33. Success Description: During CY 2000 we have been able to significantly improve the tracking process related to HW generated at NSA Naples installations. This fact has allowed us to clearly identify the type and amount of waste that's generated at NSA Naples installations, including the identification of recycling opportunities with P2/environmental and economic benefits.

Economic Benefits: The identification of recycling opportunities for most of the oily expired shelf life materials through the Italian Mandatory Consortium for Used Oils has allowed us to dispose of 58,955 pounds by recycling, with an estimated cost savings of \$30,000.

P2 Environmental Benefits: The improvement of the tracking process related to the HW generated at NSA Naples installations has significantly developed the recycling opportunities which consists of used oils and lead-acid battery recycling through the Italian Mandatory Consortiums for Used Oils and Lead Acid Batteries. In fact, by recycling we have

COMMANDER IN CHIEF, U.S. NAVAL FORCES EUROPE

NAVAL SUPPORT ACTIVITY DET CAPODICHINO NAPLES, ITALY (continued)

disposed 90,840 pounds of used oils and about 26,990 pounds of lead acid batteries. Moreover, we have also started to apply the DRMO contract for recycling of out-of-work Ozone Depleting Substances-ODS appliances. In fact, in CY2000 we have disposed of more than 1,000 out-of-work ODS appliances, mainly refrigerators, air conditioning units, freezers, and display cases, for a total weight of 165,250 pounds and a total disposal cost of \$44,650.

Other Benefits: We feel that the P2ADS report for HW can be considered a baseline for the type and the amount of the HW generated at NSA Naples installations. We also note that these data include some waste streams that have been accumulated for a long time before getting being disposed during CY 2000 (for example, out-of-work refrigerators). Therefore, we think that a comparison between CY 2000 data and CY 2001 data will be needed to better estimate the amount of HW yearly generated at NSA Naples installations.

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NAVAL SUPPORT ACTIVITY, SOUDA BAY, GREECE

34. Success Description: Prudent use of P2 initiatives has yielded a substantial reduction in HW generation.

Economic Benefits: Reduced HW disposal cost by 67% compared to the previous shipment.

P2 Environmental Benefits: Met compliance issues through P2. The success of the P2 Plan has significantly reduced potential environmental risks.

Other Benefits: NSA's pro-active P2 Plan has generated excellent customer "buy-in".

POC Name: Paul Cronenberger

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NAVAL METEOROLOGY AND OCEANOGRAPHY COMMAND

NAVAL OCEANOGRAPHIC OFFICE STENNIS SPACE CENTER, MS

35. Success Description: NAVOCEANO CHRIMP was implemented in May 1999 with an inventory of 1,500 items. To date the inventory stands at 780 items.

Economic Benefits: Through this program, we have identified identical items from different manufacturers with the same end-use. We're eliminating these like items, thus reducing our cost through waste disposal and inventory cost.

P2 Environmental Benefits: With CHRIMP our ability to track hazardous materials

NAVAL METEOROLOGY AND OCEANOGRAPHY COMMAND

NAVAL OCEANOGRAPHIC OFFICE STENNIS SPACE CENTER, MS (continued)

increased. Only designated personnel can procure hazardous materials, and all hazardous materials can now be tracked from cradle to grave.

Other Benefits: Reduced disposal costs; reduced waste; and reduced employee's exposure to toxic chemicals; reuse materials rather than disposal; and all levels of management--commanding officer; environmental officer; department heads; etc.--now have visibility of hazardous materials in their areas.

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NAVAL SEA SYSTEMS COMMAND

NAVAL SHIPYARD NORFOLK, PORTSMOUTH, VA

36. Success Description: Oils for BTU production 171.1 tons. Lead acid batteries recycled 3.6 tons.

Economic Benefits: Disposal cost avoidance.

P2 Environmental Benefits: Energy recovery. Resource reuse.

POC Name: Robert Davies
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NAVAL SHIPYARD PUGET SOUND, BREMERTON, WA

37. Success Description: The shipyard Reuse Store hazardous material inventory is now available 24 hours a day on line through the shipyard intranet. A link has been added from the shipyard intranet home page to the Reuse Store online system. This site provides a quick and easy search engine for finding reusable hazardous material available for free to qualified shipyard users.

Economic Benefits: The Reuse Store on line system is expected to provide greater visibility of excess hazardous material, thereby avoiding new procurement costs and hazardous waste disposal costs. Since it's inception in 1994, the Hazardous Material Reuse Store has saved over \$1,870,000 in material procurement and waste disposal cost avoidance.

P2 Environmental Benefits: Besides the economic benefit, the Hazardous Material Reuse Store has diverted nearly 200,000 pounds of hazardous materials from becoming hazardous waste.

POC Name: Dwight Leslie
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NAVAL SEA SYSTEMS COMMAND

NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT, RI

38. Success Description: The Submarine Sonar, Transducer and Hull Array Division is involved in research, development, and improvement of various transducers and arrays. In the course of this activity, the division investigated likely substitutes for a number of mercury containing polyurethane compounds used to encapsulate the transducers. Products used in the past that have been replaced with non-mercury containing urethanes are: Uralite 3140 and FH-3130, and Conathane TU-600. Uralite 3130 has been eliminated for some but not all uses due to a unique bonding characteristic. The primary substitute for these compounds is Uralite FH-3530. Composite Polymer Design, CPD 9130 is also used as a substitute. However, this product does not pass TCLP testing even though mercury is not listed as one of its constituents because the mercury concentration is below 1%.

Economic Benefits: The primary economic benefit is derived in the near elimination of hazardous waste disposal costs associated with this process due to mercury content in the waste products.

P2 Environmental Benefits: Substitution eliminates nearly all of the mercury from the waste stream associated with this process so that excess, cured potting material may be disposed of as trash.

Other Benefits: Noted was the fact that with the lower thresholds for certain toxic chemical use a higher degree of diligence is required in determining the product waste characteristics. Even though the MSDS may not identify a particular constituent, it may be present at a level that trips RCRA disposal requirements.

POC Name: Thomas Cook

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39. Success Description: The Engineering, Test, and Evaluation Department's Industrial Services Division has incorporated a process improvement that is benefiting Division Newport in several ways. Prior to the improvement, spray painting was accomplished using high-pressure guns. These guns used more paint primarily due to over spray and consequently required more labor per job. After a P2 opportunity assessment was conducted, High Velocity Low Pressure (HVLP) guns were purchased. The payback was immediate.

Economic Benefits: Start up costs to switch to the HVLP guns came to approximately \$5,700. The two new guns cost \$700. The time to learn the new painting technique is 100 hours at a cost of about \$5,000. Because the application process is faster, the painter is saving about 40% of his time per job or about 800 hours annually. Because of the reduction in over spray, the purchase of approximately 100 gallons of paint is avoided.

P2 Environmental Benefits: The reduction of over spray has reduced facility paint use by 100 gallons annually with an associated VOC reduction.

Other Benefits: This improvement can be adopted at any facility that engages in spray painting operations.

POC Name: Thomas Cook

NAVAL SEA SYSTEMS COMMAND

NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT, RI (continued)

40. Success Description: NUWC Division, Newport uses the HAZMATRACK system for managing its hazardous material transactions. The system is a Microsoft Access database that uses Allaire's Cold Fusion for its intranet interface. It allows all employees to view the entire hazardous material inventory. This provides a means to make small quantity transfers of material and use material common to another project that would otherwise have to be disposed. The division's overall inventory exists largely of small quantities of many types of materials due to the R&D nature of its mission. Nonetheless, any gains made in reducing overall inventory or reductions in hazardous waste disposal result in savings in procurement cost and level of effort. In the past year, over 25 transfers resulted in an estimated cost saving of \$1,300 and eliminated 17 items from inventories.

Economic Benefits: The primary cost benefit realized is the reduction of hazardous waste disposed: level of effort to pick up; characterize; label; manifest; ship and disposal cost. The secondary cost benefit is to the project sponsors. Existing material no longer required by one project is transferred to a new or existing project requiring the same material saving the cost of material and associated G&A costs of procurement.

P2 Environmental Benefits: Overall inventory reduction.

POC Name: Thomas Cook

41. Success Description: During CY00, Division Newport recycled 589 pounds of alkaline batteries by modifying a current contract with the contractor that recycles our ballasts and light bulbs.

Economic Benefits: Although the cost to recycle the alkaline batteries is comparable to the disposal cost through the DRMO contract, the cost savings derives from the administration savings since we are not required to prepare DD Form 1348s. Because the batteries are picked up at the same time as the ballasts and bulbs, there are no additional shipping costs.

P2 Environmental Benefits: The batteries are kept out of the landfill.

POC Name: William A. Cardoza

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NAVAL SECURITY GROUP HEADQUARTERS

NAVAL SECURITY GROUP ACTIVITY NORTHWEST, CHESAPEAKE, VA

42. Success Description: Defense Supply Center Richmond's Recycle Oil Program.

Economic Benefits: Cost is 18 cents per gallon to recycle. No cost for recycling oil purchased through program.

P2 Environmental Benefits: Oil recycled.

NAVAL SECURITY GROUP HEADQUARTERS

NAVAL SECURITY GROUP ACTIVITY NORTHWEST, CHESAPEAKE, VA (continued)

Other Benefits: Cost avoidance for new product purchases.

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NAVAL SECURITY STATION WASHINGTON, DC

43. Success Description: Increased use of HAZMIN center for issuing hazardous materials and using more "environmentally friendly" products.

Economic Benefits: Reduced hazardous waste disposal cost (excluding lead abatement projects) and reduced amounts of hazardous materials purchased.

P2 Environmental Benefits: Reduced number of waste streams.

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NAVAL COMPUTER AND TELEPHONE COMMAND

NAVAL COMMUNICATION STATION STOCKTON, CA

44. Success Description: We are transferring property to the Port of Stockton. In preparation for the transfer, the environmental office has been focused on projects to investigate and clean parcels prior to property transfer. We have been working closely with the regulatory agencies in this effort.

POC Name: Gail Qatsha

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COMMANDER IN CHIEF, U.S. PACIFIC FLEET

FLEET ACTIVITIES CHINHAE, KOREA

45. Success Description: Hazardous waste facility operators/generators training classes were established at the base to educate base personnel about properties, classification, compatibility, and use of various references, definition of HW, managing HW, and proper disposal.

Economic Benefits: Hazardous waste disposal costs have been barely reduced.

P2 Environmental Benefits: By properly segregating used oil, the base recycles used oil through a local contractor.

COMMANDER IN CHIEF, U.S. PACIFIC FLEET

FLEET ACTIVITIES CHINHAE, KOREA (continued)

POC Name: Chae-Mun Yi

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FLEET ACTIVITIES NAVAL AIR FACILITY KADENA, KINAWA, JAPAN

46. Success Description: Implementation of a shop towel recycling program contract.

Economic Benefits: Savings in work hours and disposal costs. Cost of oily rag disposal was \$0.36/lb. One 55-gallon drum will hold approximately 100 pounds, cost of the drum is \$60 and weighs about 62 pounds. When the rag disposal cost is figured, the weight of the drum is not deducted. This means that we paid for the disposal of 160 pounds ($\$56 + \60) = \$116, adding the labor time, with travel to DRMO for processing, \$120, which equals \$236. CFAO's monthly rag disposal works out to approximately 300-400 pounds. Currently, our monthly cost for shop towel service is 50,000 yen or \$434.

P2 Environmental Benefits: Previously, non-regulated wastes (oily rags) were incinerated. That waste stream has been eliminated.

POC Name: Masato Yokoda

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NAVAL AIR FACILITY ATSUGI, JAPAN

47. Success Description: Reduced by 89% expired shelf life material generation over the previous year. In CY99 NAF Atsugi generated 36,497 pounds of expired shelf life material, versus a generation rate of 3,905 pounds for CY00. This was accomplished through more efficient procurement and management of hazardous materials in the supply chain.

Economic Benefits: 89% reduction in costs for recycling of expired shelf life material; CY99 budget of \$7,093 reduced to a CY00 total of \$790. Greatly reduced material procurement, management, and recycling/disposal costs due to more efficient hazardous material management.

P2 Environmental Benefits: Reduced procurement of hazardous materials.

Other Benefits: Procurement cost savings for squadrons.

POC Name: Shin Arai

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COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL AIR FACILITY MISAWA, JAPAN

48. Success Description: The cornerstone of our hazardous material management and hazardous waste programs at NAF Misawa is the effectiveness of our joint service cooperation with strong emphasis on customer service to the fleet. We participate with our Air Force counterparts in the only "purple" Hazardous Material Pharmacy (HAZMART) in the Far East. We provide a single point of distribution of hazardous materials to over 60 Navy and AF commands/units. NAF Misawa has reduced the number of shop level hazardous material use points from 35 to 15 and reduced the hazardous waste accumulation points from 20 to 11 within the past two years. We provide shop level hazardous waste pick-up service to the Navy commands at Misawa, as well as coordination with the local DRMO. These efforts reduce the number of personnel required to be trained in emergency response and reduce the potential for spills or releases during transport.

Economic Benefits: We have successfully pared the hazardous materials in our joint USAF/USN authorized user list from 1,500 line items to 500 within the past two years with an estimated saving of over \$50,000. Additionally, in our hazardous waste storage area, the NAF environmental team has reduced the total number of hazardous waste accumulation points from 35 to 11 without impacting the mission. Our pick up of hazardous waste at the shop level has saved our tenant commands as much as 200 work days and an estimated savings of \$15,000 per year in personnel, spill response equipment, and vehicle cost.

Other Benefits: The local DRMO does not maintain a full environmental staff at Misawa. We must wait for environmental personnel at Sagami Depot to come to Misawa. The same person servicing Misawa also must service Iwakuni and Yokota AFB. This sometimes causing delays and backlog of hazardous waste awaiting turn-in for processing. Mercury and lithium wastes must be transported by Navy/AF personnel to Sagami Depot because DRMO cannot locate a licensed contractor within our immediate area. The local DRMO does not aggressively seek out recycle contractors for commodities such as glass or plastics, forcing us to dispose of these items that other bases may be recycling. DRMO requires us to maintain one account for disposal and another for transportation expenses. Additionally, the cut-off for turn in of hazardous waste to DRMO is early August, causing problems with forecasting end of year funding closeout. Delays of as much as 60 days from turn-in until posting to the fund account exacerbate the problem of financial management.

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NAVAL AIR WARFARE CENTER WEAPONS DIVISION POINT MUGU, CA

49. Success Description: Reduction of aerosol paints use through use of vinyl tape label making machines. This process eliminates spray paint stenciling, and provides clear and long lasting markings on shipping containers, which can be easily removed or modified.

Economic Benefits: Approximately \$5,000 per year saving in hazardous waste disposal, \$5,000 per year saving for cost avoidance associated with purchase of aerosol paints and stencils.

P2 Environmental Benefits: Reduction of VOCs released to the atmosphere, decrease in

COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL AIR WARFARE CENTER WEAPONS DIVISION POINT MUGU, CA

(continued)

hazmat storage at the work site, and reduction of hazardous waste generated by approximately one ton per year.

Other Benefits: Elimination of respirator use and human health risk from the harmful chemicals. Provides cleaner operation and paper reduction since the need to make cardboard stenciling is removed.

POC Name: Norman Griffaw

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NAVAL BASE VENTURA COUNTY POINT MUGU, CA

50. Success Description: Success Loop Waste Water System at Building 352.

Economic Benefits: Zero discharge to the sanitary sewer system.

P2 Environmental Benefits: This system allows us to recycle our wastewater without discharging to the local sewer system, and with the added benefit of recycling oil that is cleaned off of the equipment.

Other Benefits: System only works well with equipment that does not put a lot of solids into the device.

POC Name: Norman Griffaw

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NAVAL STATION EVERETT, WA

51. Success Description:

1. To get better control on the sandblast grit at GSE we have implemented a log to track the amount of white gear vs. yellow gear that is being sandblasted and compared these numbers with lab analysis to determine when the waste is a regulated or non-regulated waste. If assumptions are correct, we should be able to predict when the waste stream will fail TCLP testing and correctly profile it as such.

2. We will be taking advantage of the new "universal waste" rules to reduce our hazardous waste amounts by managing batteries and fluorescent lamps under the new rule.

Economic Benefits:

1. Non-regulated blast grit cost less to dispose of than regulated blast grit. With today's prices the regulated blast grit costs \$0.48 per pound, state regulated waste is \$0.24 per pound, and non-regulated waste is \$0.07 per pound. Lab analysis testing is in progress.

2. Batteries and fluorescent lamps are managed as "universal waste" and do not count toward hazardous waste weight generated. Annual state fees are based on the amount of hazardous waste generated.

P2 Environmental Benefits:

1. Non-regulated sandblast grit is indicating that all the old paint that contained chromium and

COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL STATION EVERETT, WA (continued)

lead are purged out of the system. The new paints being used are less hazardous and therefore friendlier to the environment in both application and disposal. 2. No effect.

Other Benefits: We are implementing two new P2 projects for 2001:

1. Battery collection. In response to the new universal waste rules we have bought and placed small containers in all of the major buildings to collect all the small batteries that may not otherwise be getting into the proper waste stream.
2. Rag laundering. FISC is writing a rag laundering contract to set up an oily/greasy rag laundering service for ships and tenants. Most ships and tenants have agreed to try out the service when it is available. Lockers have been purchased to make the dirty rag and clean rag exchange easier for ships and the contractor.

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NAVAL SUBMARINE BASE BANGOR, SILVERDALE, WA

52. Success Description: Subbase Bangor has added a large list of Volatile Organic Compounds (VOCs), to our already extensive list of chemicals to be eliminated/minimized.

Economic Benefits: Eliminating or minimizing hazardous materials containing VOC chemicals will save waste disposal dollars.

P2 Environmental Benefits: Eliminating or minimizing HM containing VOC chemicals will reduce potential releases to the environment.

Other Benefits: Eliminating or minimizing HM reduces workers exposure to hazardous chemicals and results in a safer working environment.

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NAVY SUPPORT FACILITY DIEGO GARCIA, IO

53. Success Description: On-site hazardous material reissue/recycling of 17,533 pounds and on-site hazardous waste treatment of 131,879 pounds.

Economic Benefits: Cost avoidance of \$257,300 for on-island re-issue/recycling of excess or expired hazardous material for non-critical application and on-island treatment of hazardous waste versus off-island shipment for disposal.

P2 Environmental Benefits: Reduced the amount of hazardous waste and hazardous material in the Satellite Hazardous Waste Accumulation Point and Hazardous Waste Storage Area for disposal and the potential risk of spillage.

POC Name: Edgardo P. Ibay

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COMMANDER IN CHIEF, U.S. PACIFIC FLEET

PACIFIC MISSILE RANGE FACILITY HAWAIIAN AREA BARKING SANDS, HI

54. Success Description: Use of off-specification jet fuel for fire training.

Economic Benefits: No disposal or shipping costs. Eliminated purchase of materials for fire training.

P2 Environmental Benefits: Eliminated a waste stream.

POC Name: Priscilla "Pat" Ruiz

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WEAPONS SUPPORT FACILITY INDIAN ISLAND, PORT HADLOCK, WA

55. Success Description: Recycled nearly 56,000 pounds of forklift batteries at no cost to the facility. These batteries had been accumulating for nearly 20 years in a storage building on base.

Economic Benefits: Cost savings of sending out through DRMO contract of \$0.18/pound, or over \$10,000.

P2 Environmental Benefits: Non-renewable resources will be preserved when the lead and plastic of these batteries is reused.

POC Name: Terry Gosney

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CY 2000
POLLUTION PREVENTION ANNUAL DATA SUMMARY
SOLID WASTE SUCCESS STORIES
BUREAU OF MEDICINE AND SURGERY

NATIONAL NAVAL MEDICAL CENTER BETHESDA, MD

1. Success Description: NNMC has established a Hospital New Products Committee. The committee is responsible for evaluating products in the hospital. We use a product evaluation sheet for all new products proposed for use in the hospital. This sheet contains questions regarding the product's effect on the environment.

Economic Benefits: Continue to introduce environmentally friendly products and to reduce the amount of solid waste in landfills.

P2 Environmental Benefits: 1. Acquisition of STERRAD 100 Sterilizer System. The STERRAD 100 sterilization system is a low temperature unit used to sterilize items that are sensitive to heat and moisture. The STERRAD system provides an environmentally safe alternative to the use of ethylene oxide (EO) as a sterilizing agent. EO is toxic, a suspected carcinogen, and is flammable.

2. Replace wet radiography film processors with dry film processing systems. This eliminates hazardous waste disposal cost associated with traditional film processing operations.

Other Benefits: NNMC has a volunteer program with the American Red Cross and Walt Whitman High School to allow mentally-challenged adults to assist with collecting recyclables materials.

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CHIEF OF NAVAL EDUCATION AND TRAINING

NAVAL AIR STATION CORPUS CHRISTI, TX

2. Success Description: NAS Corpus Christi purchased a fuel recycling unit. The recycling unit will be operational in CY01.

Economic Benefits: This will help offset the cost associated with fueling the vehicles at NAS Corpus Christi.

P2 Environmental Benefits: The recycling unit will be used to recycle off-spec fuel for use by GSA and government vehicles located at NAS Corpus Christi. Without the unit, the fuel is sent off base to be used in a fuel-blending program.

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CHIEF OF NAVAL EDUCATION AND TRAINING

NAVAL AIR STATION MERIDIAN, MS

3. Success Description: NAS Meridian encourages use of the scrap metal recycling program. We are receiving great participation in this program.

Economic Benefits: Recycling dollars have increased this past year.

P2 Environmental Benefits: We emphasize the importance of recycling and are establishing recycling and waste reduction projects for NAS Meridian and local communities.

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NAVAL TRAINING CENTER GREAT LAKES, IL

4. Success Description: 1. Increased recycling due to procurement of larger recycling bins for housing residents. 2. Currently using "Smart Dumpsters" in place of front loading containers at eight locations.

Economic Benefits: Using "Smart Dumpsters" has cut solid waste costs. Less material has gone to landfill by virtue of recycling increase base wide.

P2 Environmental Benefits: Less landfill space used, and military and civilian awareness of the importance of recycling.

Other Benefits: As shown there has been a slight increase of solid waste over previous year due to large scale demolition and construction projects.

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CHIEF OF NAVAL OPERATIONS

NAVAL DISTRICT WASHINGTON

5. Success Description: The main objectives of the Department of Defense (DOD) Qualified Recycling Programs (QRP) are to establish goals for solid waste prevention, divert non-hazardous solid waste from the waste stream, establish regional recycling programs, and operate recycling programs in a cost effective manner.

The formation of strong partnerships with other area activities and consolidating recyclable material into the Naval District Washington (NDW) Regional Program, has proven to be the most successful approach for compliance with the objectives of OPNAV and DOD directives. As stand-alone recycling programs, activities such as Naval Surface Warfare Center (NSWC) Carderock, NSWC Dahlgren, NSWC Indian Head and Bolling Air Force Base, cannot operate a

CHIEF OF NAVAL OPERATIONS

NAVAL DISTRICT WASHINGTON (continued)

cost effective recycling program. Additionally, these small operations are at the mercy of the scrap dealing "sharks" which thrives on small generators of unprocessed commodities. Naval District Washington's Regional Recycling Center processes and recycles more than 2,000 tons of high-grade office paper and a combined total of 508 tons of newspaper, cardboard, phonebooks, and shredded paper annually.

The National Capitol Region (NCR) covers more than 32 square miles crossing three regional boundaries in two states and the District of Columbia. The program provides recycling services for 11 Navy and Marine Corps commands, Andrews Air Force Base, Bolling Air Force Base, Army Material Command, Army Family Support Center, Pentagon Support and 27 government leased high-rise facilities. Additionally, the recycling center operates a community outreach program for Saint Elizabeth National Mental Center. Based on current data, NDW Regional Recycling program is the most successful DOD paper recycler in the country. The program is not supported by vast quantities of high valued scrap metals (copper, brass, aluminum, lead, etc.).

We do it and do it extremely well with scrap paper!

The Washington recycling service area is divided into five zones each with its own crew and truck. The crews have a morning and afternoon run, providing recycling services using the room to room floor to floor or stages service area pick-up method. The recycled paper is then loaded into laundry carts for the trip back to the recycling center.

There is no room for storage or staging of the baled materials. All available space in the 6,000 square foot recycling nerve center is used for the operational area of balers, conveyors, dump hoppers, scales, paper handling equipment, office space and rest room facilities. Due to the space limitation, the NDW Recyclers quickly process and bale the material and transport the finished bales to pre-staged semi-trailers.

The activity at the recycling center is at its peak when the trucks return from a run. White paper, mixed paper, newspaper, and shredded paper all come to the center in laundry baskets. The baskets are color coded and marked with the name of the commands they serve. The loaded baskets are heavy, but easy to handle with the material handling equipment. Most baskets contain white office paper that is promptly baled.

The baling process requires the coordinated efforts of six to eight personnel. The paper filled laundry baskets are placed in a dump hopper. The hopper drops the paper on a sorting line so workers can remove colored paper or other contaminants for the white paper. This attention to purity assures the paper brings top dollar when sold. From the sorting line the paper goes up a belt into a horizontal baler. Workers scramble to keep up the pace of making bales weighing approximately 1,400 pounds. The finished bales are then transported and loaded on a

CHIEF OF NAVAL OPERATIONS

NAVAL DISTRICT WASHINGTON (continued)

semi-trailer. Every three days a trailer loaded with more than 21 tons is shipped directly to paper mills for de-inking and pulping for new paper.

This operation generated enough revenues to pay for the personnel, trucks, and other cost associated with recycling. After expenses, net revenues are used to support programs in accordance with OPNAV and DOD directives.

Recycling market prices may rise or fall, but Jim Mullen, the regional recycling manager, negotiated a contract with a local vendor that gives him the ability to ride the fluctuation of the recycling market. His selling price for paper is geared to the "Yellow Sheet" prices less \$5 per ton. The "Yellow Sheet" is a weekly publication of the Official Board Markets and reports the selling prices of recycled materials in each region of the U.S. The recycling community uses the "Yellow Sheet" to track regional commodity prices. NDW Regional Recycling Center recycles other commodities but the program thrives on high quality office paper.

Economic Benefits: Our program sets the standards for regional recycling, and we have been extremely successful in meeting or exceeding the requirements of federal, state, and local recycling guidelines. A few specific examples are:

	FY99	FY00
a. Overall Tons Recycled	2,777.3	3576.5
b. Paper Products	1833.3	2015.8
c. Ferrous Metal	708	1182
d. Non-Ferrous	26	102
e. Aluminum Cans	11.5	14.8
f. Gross Scrap Sales	\$216,906.61	\$351,410.39
g. Cost Avoidance	\$208,000	\$268,237.50
h. Net revenue	\$64,000	\$192,469
Cost Avoidance plus Net Revenue for FY99=\$272,000		
Cost Avoidance plus Net Revenue for FY00=\$460,706.50		

In FY00, there was a significant increase of other non-revenue generating materials such as tires, glass, plastic, and wood. We operate as a volume generator of market ready materials (baled to market standards), which enables us to sell "mill direct" and command top market dollar.

By establishing partnerships with the smaller commands and incorporating their recyclables into our program, we are able to protect their financial interest, reduce their operational cost and return profits to the base recycling programs.

Noteworthy examples of a successful partnership: Established a partnership with NSWC Indian Head. This partnership enabled us to eliminate a \$325 monthly trailer staging and pulling fee and increase the value of their paper (loose) from \$55 a ton to \$115 baled. We consolidate all paper and sell bulk at \$185.

CHIEF OF NAVAL OPERATIONS

NAVAL DISTRICT WASHINGTON (continued)

Established a partnership with Andrews Air Force Base through a memorandum of agreement (MOA) resulting in the elimination of a combined janitorial (for collecting recyclables) and recycling contract saving the base \$132,000 in contract fees, and a net profit of \$22,000 in scrap sales.

Established a MOA with NSWC Dahlgren saving the base \$16,000 in contract cost, and a net profit of \$7,400 in scrap sales. Recently established a MOA with Bolling Air Force Base. Net savings not established at time of this report.

P2 Environmental Benefits: Naval District Washington (NDW) and the commands of the National Capitol Region (NCR), successfully removed more than 3,576.5 tons of solid waste from the waste stream. This enabled NDW and the NCR to save more than \$268,000 in tipping fees.

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6. Success Description: A total of 154,780 pounds of plastic media was recycled by U.S. Technology Manufacturers and made into lawn/patio furniture. A total of 42,800 pounds of plastic media was recycled by Poly Pacific Manufacturers and made into fencing material.

POC Name: William Beattie

NAVAL ACADEMY, ANNAPOLIS, MD

7. Success Description: The Naval Radio Transmitter Facility (NRTF), Annapolis, MD was disestablished as result of Base Realignment and Closure (BRAC). The property was turned over to the U.S. Naval Academy and established as a permanent wildlife preserve. Numerous environmental concerns were raised during the BRAC process. One of these concerns is the solid waste resulting from the demolition of 16 large radio towers. ROICC and the Environmental Division worked together and to address C&D reuse/recycling issues that were included in the demolition project. As a result, a total of 4,556 tons of C&D were either reused or recycled; 2,591 tons of scrap metal and 675 tons of scrap wood were transported to recycling companies; and 1,292 tons of concrete were reused for a shoreline repair project at the Naval Academy.

Economic Benefits: Exact dollar figures were not provided; however, the contractor netted over \$100,000 on the scrap metal. Estimated that the scrap wood cost \$30 per ton (total \$20,000) and the concrete cost for reuse was zero. Purchase of 675 tons of concrete would have been \$2,500.

Landfill fees are \$65 per ton x 4556 = \$296,140.

\$100,000 Proceeds

- \$20,000 Cost

\$80,000 Proceeds

CHIEF OF NAVAL OPERATIONS

NAVAL ACADEMY, ANNAPOLIS, MD (continued)

\$ 296,140 Potential Landfill fee
\$ 2,500 Concrete
\$ 298,640 Potential cost avoided

The economic benefits for reuse and recycling were factored into the contract cost.

P2 Environmental Benefits: Reduce landfill space used. Continue the recycling close-loop process. Tracking C&D volumes.

Other Benefits: Environmental and ROICC partnering for environmental concerns and economic benefits.

POC Name: Harrison Butler

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Code: 170

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NAVAL SUPPORT ACTIVITY MONTEREY BAY, CA

8. Success Description: Recycling of construction debris.

Economic Benefits: Saving of landfill space.

P2 Environmental Benefits: Great savings to the Navy due to recycling, and also the space saved at the local landfill.

POC Name: Al Heinetz

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Code: 2314

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NAVAL SUPPORT ACTIVITY MID SOUTH MILLINGTON, TN

9. Success Description: We collected and sold 620 tons of metals, paper and paperboard, plastic, and wood.

Economic Benefits: We received recycling revenues of \$31,655 dollars and avoided landfill costs of \$17,856.

P2 Environmental Benefits: We diverted these waste materials from the local landfill.

POC Name: Mr. Larry Jones

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Code: 0101

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COMMANDER IN CHIEF, U.S. ATLANTIC FLEET

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MS

10. Success Description: CBC Gulfport has picked up the Mississippi Air National Guard under our base recycling program. They contribute paper, cardboard, and metals. CBC is receiving all of the funds for this material.

COMMANDER IN CHIEF, U.S. ATLANTIC FLEET

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MS (continued)

Economic Benefits: This has increased our recycling revenue and has helped them to establish a recycling program.

P2 Environmental Benefits: This has helped the Mississippi Air National Guard to keep this material out of the landfill.

POC Name: Gary Broom

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Code: 410.2

Fax: 228-868-3116

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NAVAL STATION NEWPORT, RI

11. Success Description: Modified our janitorial contract by substituting one trash collection pickup in office spaces per week for the pickup of cardboard, all paper, glass, plastic, and tin cans.

Economic Benefits: This action is proposed to raise the total volume of recycled materials by 5-6 % in the next 12 months.

P2 Environmental Benefits: Accomplished consistent pickup of recyclable materials. The amount of items recycled rose 3% in the first six months.

POC Name: Deb Moore

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Code: 100

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NAVAL SUPPORT STATION MECHANICSBURG, PA

12. Success Description: At the end of FY00, we installed a baling machine provided via PPEP and began operation. Immediate cost savings were \$10,000 per year; which was the cost previously spent on supplying tri-walls for trucking paper off base. In addition, we implemented a cardboard recycling program that had previously been handled by a nearby Army installation, with zero profits returned to our base. Now we will retain 100% of profits from cardboard.

Economic Benefits: Immediate annual cost savings of \$10,000. Increased revenue from cardboard sales that had previously been given to nearby Army base. Anticipated yearly profit of \$25K.

POC Name: Catherine Mulhearn

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Code: 09M22

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U.S. NAVAL STATION ROOSEVELT ROADS, PR

13. Success Description: Since beginning operation of the composting area at the new vertical lift on the existing landfill in June 2000, we have diverted 863 tons of wood material (pallets and green waste). This represents an average of 123 tons per month of waste diverted to composting.

COMMANDER IN CHIEF, U.S. ATLANTIC FLEET

U.S. NAVAL STATION ROOSEVELT ROADS, PR (continued)

Other Benefits: Being able to divert wood waste from landfill extends the life of our landfill.

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NAVAL AIR SYSTEMS COMMAND

NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION PATUXENT RIVER, MD

14. Success Description: Wood waste recycling partnership with St. Mary's County, MD.

Economic Benefits: St. Mary's County is mulching scrap wood, pallets, crates and all untreated raw lumber generated by the Naval Air Station. This is at a reduced cost of \$30 per ton versus land filling at \$44 per ton. County residents can get mulch for free. Base contractors can purchase mulch at a significantly reduced rate of only \$10 per ton, thereby lowering contract pricing on landscaping services to the base. The base saves \$14 per ton, the wood is not land filled, and the base received recycling credit for each ton mulched.

P2 Environmental Benefits: Wood waste is diverted from the landfill and used for mulching.

Other Benefits: County residents receive mulch for free, base landscaping contractors can purchase at a reduced rate.

POC Name: Christopher Hill

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COMMANDER IN CHIEF, U.S. NAVAL FORCES EUROPE

NAVAL ACTIVITIES UNITED KINGDOM LONDON, UK

15. Success Description: This year NAVACTUK increased its recycling by 12 tons, with no added costs. The command continues to donate used toner cartridges to Imperial Cancer Research (ICR). With NAVACTUK's help, the southern region of ICR has raised \$37,000 which goes to ICR to further their research into life threatening diseases. This has worldwide benefits. Used postage stamps are collected and given to a local hospice.

Economic Benefits: Reduction in landfill costs and the use of natural resources.

P2 Environmental Benefits: Landfill and incineration avoidance by 12 tons.

Other Benefits: Due to the command's impetus the recycling of solid waste has steadily increased. The command is looking for more ways to reduce solid waste disposal via recycling.

POC Name: M. Juden

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COMMANDER IN CHIEF, U.S. NAVAL FORCES EUROPE

NAVAL AIR STATION SIGONELLA, ITALY

16. Success Description: Diverted 729.54 tons of recycled material from landfill.

Economic Benefits: Avoided spending \$9,878 in tipping fees, and resulted in \$10,097 of resale values for aluminum, cardboard, plastic, and wooden pallets.

POC Name: Mauro Cacia

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Code: N8

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Email: mcacia@nassig.sicily.navy.mil

NAVAL SUPPORT ACTIVITY, SOUDA BAY, GREECE

17. Success Description: Diverted one ton of scrap wood from landfill through the base community relations project. The Public Affairs Office contacted a local high school wood shop. They were able to use all the scrap wood normally disposed via the landfill.

P2 Environmental Benefits: Diversion of solid waste from landfill.

Other Benefits: Community relations is improved and communication with local officials is enhanced.

POC Name: Paul Cronenberger

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Fax: 011-30-821-21448 Email: cronenbergerp@souda.navy.mil

NAVAL FACILITIES ENGINEERING COMMAND

NAVY PUBLIC WORKS CENTER PEARL HARBOR, HI

18. Success Description: PWC manages and operates the Bio-solids Treatment Facility (BTF) at what was NAS Barbers Point. It combines two unwanted waste streams, bio-solids (sludge) and green waste, converting them into a desirable and safe end product of compost. The compost will be used for landscaping thereby circumventing the landfill and extending the landfill lifetime. BTF treats 15,600 wet tons of sludge annually. The BTF accepts bio-solids and green waste daily from the Navy, Army, City and County of Honolulu.

Economic Benefits: Approximate cost savings for Calendar Year 2000 is \$144,437.

Approximate cost savings for the BTF during operations (July 1997-December 2000) is \$436,556. Also, the BTF eliminated the need to build a landfill or use the existing city and county landfill which is running out of space.

P2 Environmental Benefits: Elimination of bio-solids disposal in landfills. Producing a usable product--compost.

Other Benefits: The BTF serves not only the Navy but also the Army, City, and County of Honolulu.

POC Name: Terrie Yamamoto

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NAVAL SEA SYSTEMS COMMAND

NAVAL SHIP SYSTEMS ENGINEERING STATION CARDEROCK DIVISION

19. Success Description: Established an improved process for collection of used computer printer cartridges. Code 027 recyclers collect used computer printer cartridges and transports them to supply where they are picked up and returned for recycling. While these cartridges usually come with prepaid shipping labels for return/recycling, the shipping company charges a fee for a non-standard stop to collect them. Code 027 established a policy where boxed and labeled printer cartridges would be placed at collection points with the paper and aluminum cans where they can be collected by the Code 027 recyclers. The recyclers then deliver them to supply for transport for recycling.

Economic Benefits: Even though labels are prepaid, the shipping company would charge to come to each building for pickup; or personnel would have to go to supply to drop them off. Code 027 recyclers regularly stop in these areas to pickup paper and cans. The new process resulted in only a minimal amount of additional effort to pickup the cartridges and deliver them to supply.

P2 Environmental Benefits: By simplifying and standardizing the process we have increase the possibility that cartridges will be returned for recycling.

POC Name: Paul Breeden

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Code: 027

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NAVAL SHIPYARD PUGET SOUND, BREMERTON, WA

20. Success Description: Because our facility performs ship breaking and dismantling, our annual waste totals are very workload-dependent. A by-product of our work is PCB bulk product waste. In the past, waste that could not be cost effectively abated has been disposed at a PCB solids disposal landfill (TOSCA) at high cost. Due to the new PCB Disposal Rule, we have been able to downgrade much of the waste to a solid waste and divert it to a RCRA Subtitle D landfill. The first shipment took place on 11 December 2000.

Economic Benefits: In CY99, 1,950 tons of PCB bulk product waste was disposed at \$1,180/ton plus transportation. The total cost was \$2,301,000 plus transportation. This same waste, under the new rule and contract, would have cost \$552,960 which includes the cost of transportation (1,950 at \$288/ton), a cost savings of 76%.

POC Name: Linda E. Longcrane

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Code: 106.32

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21. Success Description: The balance of the keel block reuse contract that began in CY99 was completed in CY00. To review: the shipyard uses wooden keel blocks to support vessels sitting in dry dock. Eventually, they lose their integrity and become compressed, rendering them unusable for their intended purpose. Instead of disposal, we requested DRMO to make arrangements with the State of Nevada to use them at their testing range in the desert. Because the state had also made arrangements for transportation, we saved in transportation labor, maintenance and equipment costs.

NAVAL SEA SYSTEMS COMMAND

NAVAL SHIPYARD PUGET SOUND, BREMERTON, WA (continued)

Economic Benefits: In CY00, we save the Navy \$22,950 in transportation costs and landfill tipping fees, and truck wear-and-tear of 12 round trips carrying maximum weight.

P2 Environmental Benefits: Diversion of 231 tons of waste from the landfill.

POC Name: Linda E. Longcrane

NAVAL SURFACE WARFARE CENTER DAHLGREN DIVISION, DAHLGREN, VA

22. Success Description: We have partnered with the local community in our paper recycling program. Through a joint effort of the local high school, the local Girl Scouts, the King George Animal Rescue League (KGARL), and military service organization on base, we are collecting paper at the high school and the local library. We provided the collection containers and the service organizations provided the labor and transportation to the base. We teamed the KGARL up with the library to allow KGARL to take newspapers from the library when they needed them for puppies.

Economic Benefits: All office paper waste from the high school and library are donated to our recycle program. The high school and library do not have to pay to throw away these items.

P2 Environmental Benefits: Office paper products are not put in the local landfill.

POC Name: Cheri L. Kennedy

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NAVAL UNDERSEA WARFARE CENTER DIVISION, NEWPORT, RI

23. Success Description: During CY00, Division Newport decreased the amount of solid waste land filled by 77.17 tons compared to CY99 and 152 tons compared to CY98. Because of this, the janitorial contract has been modified. The emptying of employee's trashcans dropped from five times per week to three times and now to two times. The division also decreased the total amount of material recycled in CY00 by 66.36 tons but still increased its recycling rate to 59%, which is up from 57% the previous year. Also, because of increased awareness, computer based programs, and decreasing printed documentation, each employee's yearly average of solid waste generated dropped from 687 pounds per person in CY99 to 625 pounds in CY00. This figure was over 900 pounds in CY97.

Economic Benefits: As a result of the decrease in solid wasteland filled, the division saved approximately \$5,000 in tipping fees and \$3,000 in transportation fees. Recycling efforts (600 tons in CY00) saved the division over \$36,000 in tipping fees and approximately \$18,000 in transportation costs. The division also received over \$10,000 in proceeds from scrap metal and paper sales.

P2 Environmental Benefits: Overall reduction in solid waste generation saves on landfill space.

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Code: 551

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NAVAL RESERVE FORCES COMMAND

NAVAL AIR STATION JOINT RESERVE BASE NEW ORLEANS, LA

24. Success Description: In late 1999, NAS JRB New Orleans began implementing what is now a full scale operating compost facility. In 2000, we composted and screened the final product of our first test piles, and it was a major success.

Economic Benefits: We have eliminated the use of a 20 cubic yard dumpster used by the ground maintenance contractors. The dumpster was used to dispose of any green or wood waste debris from our installation.

P2 Environmental Benefits: Working with the Public Works Department, we are able to initially eliminate up to 780 cubic yards of wood material being disposed in two 30 cubic yard dumpsters. This alone will save between \$5,000 and \$8,000.

Other Benefits: The benefit of composting is that it doesn't require a substantial amount of labor. The debris to some degree can accumulate and the windrows will compost on its own, but at a slower rate. From the PPETS Program we have have obtained all the equipment necessary to operate our compost operation.

POC Name: Brian Maynard

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COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL SHIPYARD INTERMEDIATE MAINTENANCE FACILITY, PEARL HARBOR, HI

25. Success Description: During CY00, PHNSY & IMF were successful in negotiating a lower disposal rate and implementing a process/procedure change in the way spent abrasives are disposed. Spent abrasives are now collected in trailers at the job site and transported directly to the disposal site.

Economic Benefits: PHNSY & IMF realized a cost savings of just under one million dollars and 166 work days in just seven months. This labor was redirected to the waterfront to support customer work.

P2 Environmental Benefits: The spent abrasives used to be transported from the job site and dumped into bays waiting laboratory testing. When laboratory testing was complete, the abrasives were loaded and moved for final disposal. Each time the abrasives were moved workers were exposed to the dust generated. Dust also settled on work areas nearby. Loading the trailers at the job site decreases the amount of dust generated and employee exposure. The trailers also provide control for rainwater runoff.

Other Benefits: Decreased worker exposure to the spent abrasives. Less labor is required to load the abrasives when it is performed at the job site. The abrasives are loaded and unloaded only one time.

COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL SHIPYARD INTERMEDIATE MAINTENANCE FACILITY, PEARL HARBOR, HI (continued)

POC Name: Herbert Love
Commercial: 808-474-9533 **Code:** 106.3
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26. Success Description: The PHNSY & IMF Environmental Division worked with the Pearl Harbor Regional Qualified Recycling Program to allow crushed paint cans and aerosol cans to be recycled beginning December 2000. Prior to this, crushed paint and aerosol cans were land filled.

Economic Benefits: Transportation and disposal costs of \$12,300 were saved annually with the recycling of the crushed paint and aerosol cans. In addition, monetary proceeds from the recycling of the crushed paint and aerosol cans exceed \$1,000 annually.

P2 Environmental Benefits: By recycling the crushed paint and aerosol cans, more than 40 tons of recyclable scrap metal is diverted from the landfill. There is a potential to divert more than 36 tons of recyclable metal from the landfill.

POC Name: Karrie Maeda
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FLEET ACTIVITIES CHINHAЕ, KOREA

27. Success Description: Although we have not developed our base QRP, we have a recycling program. Our QRP is scheduled to be developed in FY01, pending availability of funds. We are recycling glass, paper, cardboard, aluminum cans, plastics, styrofoam, and metals. Wood is recycled into wood chips by our tub grinder. The wood chips are used on our jogging trail along perimeter fence.

Economic Benefits: Average annual cost avoidance of \$20,000 with \$3,000 in earnings.

P2 Environmental Benefits: We are making every effort to minimize our solid waste generation through recycling.

Other Benefits: By recycling our solid wastes, we are decreasing landfill use for the City of Chinhae. Also by recycling, we have established a recycling account that can be used in our solid waste management plan program.

POC Name: Felix R. Udasco
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COMMANDER IN CHIEF, U.S. PACIFIC FLEET

FLEET ACTIVITIES SASEBO, JAPAN

28. Success Description: The pending disposition of sonobuoy cases and other related plastic scrap resulted in an accumulation of 43 tons of recyclable material. An additional concern was that the material had been in open storage for a long time and was deteriorating from exposure to the elements. Repetitive attempts to sell this material through DRMS sales program proved unsuccessful. This was mainly because of exorbitant costs required to ship this bulk material to a distant plastic recycling plant, which would be unprofitable for potential buyers. Through a team effort FLEACT Recycling Center and ordnance personnel we developed a material chipping process that used P2 furnished equipment that was already on hand to reduce the volume. Prospective buyers and the plastic recycling plant examined samples of the chipped material. They determined it was now cost effective for them to purchase and ship the material. Recycling and sales are in progress.

Economic Benefits: The process realized an immediate saving of \$27,340 for disposal cost avoidance and an estimated \$1,900 in sales proceeds.

P2 Environmental Benefits: The process has been incorporated into the component disassembly program and diverts recyclable plastic material from the solid waste disposal stream.

POC Name: Dave McLintock

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NAVAL AIR FACILITY ATSUGI, JAPAN

29. Success Description: More than doubled the solid waste diversion rate. CY99 diversion rate of 14.4% increased to a CY00 diversion rate of 30%.

Economic Benefits: CY00 NAF Atsugi solid waste recycling returned \$93,763 in direct proceeds and reduced tipping fees by \$125,845.

P2 Environmental Benefits: Diverted 3,355 tons of solid waste from the waste stream into local recycling markets. This eliminated \$125,845 in tipping fees and helped to extend the active life of local landfills and incinerators.

Other Benefits: Improved public image.

POC Name: Jeff Laitila

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NAVAL AIR FACILITY EL CENTRO, CA

30. Success Description: Regionalization has helped the QRP facility to operate more effectively with better equipment, training and adequate staffing.

Economic Benefits: Recycling revenues of \$54,720.

P2 Environmental Benefits: Diversion of 4,001.495 tons. Granite Construction Company was contracted to redo taxiway and runway renovations. Approximately 3,870 tons of asphalt were recycled.

COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL AIR FACILITY EL CENTRO, CA (continued)

Other Benefits: Participation at the NAF El Centro air show provided local and public awareness of the validity and significance of recycling.

POC Name: Jose Galvan

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NAVAL AIR FACILITY MISAWA, JAPAN

31. Success Description: Naval Air Facility Misawa, Japan is located in the northeast portion of Japan. The area is underdeveloped and the economy is based on agriculture and limited industrial growth. Recycling is limited to aluminum cans, white paper, and cardboard. Although we are located on an Air Force installation, our recycling program is the only formal effort in this area. We have recently negotiated with the 35th Environmental Flight to open a joint recycling center and expect to double our efforts within the next two years. Our recycling program is small with only one full time military and one part time local national. We have established an affirmative procurement process through the local GSA office to increase the recyclable products available, i.e., recycled bond paper and recycled 3-ring binders. Additionally, we send expended toner cartridges to the manufacturer for recycling. The local AAFES recycles batteries through a local vendor. The Japanese Government recently enacted the Recycle Act, effective April 01, and we believe this will increase the motivation within the local community to recycle as well as offer possible new opportunities for our efforts. NAF Misawa was granted a waiver from the requirement to establish a formal recycling program due to the limited opportunities for resale in the local community. The funds generated from our efforts are used to support environmental events with the local community, i.e., beach clean-up, salmon fingerling releases into local rivers, and environmental clean ups at the Towada Wildlife Refuge. Our effort to coordinate with local vendors is a success. In January 1998 only aluminum cans were recycled, using the base solid waste contractor as a recycler. Later that year, after some research and a great deal of venturing off base, a contractor in Towada Town agreed to take white office paper and cardboard. Cardboard is now the commodity generating the largest portion of our revenue. Jet fuel, captured during engine maintenance, and solvents are being marketed via the local DRMO for reuse as a blending agent to local bus and truck operators. Finally, our Hazardous Materials Pharmacy, jointly operated with the 35th Logistics Squadron, has reduced the authorized user list by 50%. Air Force policy does not allow for the return of unused portions of issued hazardous materials. NAF Misawa has taken the lead and is now accepting limited amounts of reusable products from Air Force activities and offering free issue to base activities. This avoids the additional disposal cost if the products were not completely used. NAF Misawa was recently selected for the FY2000 Environmental Stewardship Flagship Navy Community Award Winner for a medium sized overseas command.

Economic Benefits: Although our program is small and somewhat diffused, we are realizing economic benefits. Many of the benefits enjoyed by other Navy commands are unavailable to us due to contract control by the Air Force and limited markets in northern Japan. We identify new markets and/or process changes when and where available. Our limited recycling program has

COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL AIR FACILITY MISAWA, JAPAN (continued)

reduced the solid waste by 41 tons a year, all of which would otherwise go into local land disposal facilities (there are no sanitary land disposal facilities in northern Japan). We expect to double this volume in next two years due to our partnership with the Air Force Environmental Flight and the enactment of the Japanese Recycle Law. We do not have a formal QRP program and were granted an exemption by CINCPACFLT due to the limited resale opportunities in this area. The approximately \$2,000 in revenue generated by our staff recycling effort is used to support numerous environmental clean up events with the local community and displays our concern for the host nation's environment. The good will of our host nation is critical to our continued presence in Japan. The reduction of our authorized user list from approximately 1,500 line items to just over 500 has reduced our disposal of expired shelf life commodities saving approximately \$10,000 over the past two years and reduced excessive commodity ordering. We continue to work closely with the deployed aviation squadrons and COMNAVAIRPAC to identify less hazardous materials. One example is the replacement of ethylene glycol deicing fluid, which is a marine pollutant, with propylene glycol. Although the replacement product cost more, we have reduced the environmental impact by over 1,000 gallons per year to ground and surface waters. This was done by removing the toxic properties of the tarmac run off into storm drains which feed into a local fresh water lake. It should be noted that the Air Force and the Japan Self Defense Force continue to use ethylene glycol for their deicing operations. Navy leadership that allowed us to reissue unused Air Force hazardous materials at the pharmacy has saved another \$4,000 per year in disposal cost. Recycled JP-8, via the DRMO contract, as a blending agent to local contractors further reduces our disposal cost by approximately \$3,000 per year.

P2 Environmental Benefits: NAF Misawa's effort has resulted in the diversion of 41 tons of solid waste from the local landfill. We continue to look for opportunities to display our environmental stewardship, taking the lead when and where possible. Although the environmental benefits from our local clean up efforts are hard to enumerate there is a positive gain through the good will of the local communities for our continued presence in Japan. Our work with COMNAVAIRPAC's Environmental Teams to find less hazardous materials continues to increase the safety of our personnel and decrease our disposal cost.

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Code: 110

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NAVAL AIR STATION FALLON, NV

32. Success Description: Due to regionalization, we were able to cancel contract with ALCON Aluminum.

Economic Benefits: Aluminum cans were sold for \$1 instead of 30 to 50 cents per pound.

Other Benefits: We were able to move large quantities of cans to San Diego and sell them as part of a large sale, increasing revenues.

COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL AIR STATION FALLON, NV (continued)

POC Name: Cecil Cook
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NAVAL AIR STATION LEMOORE, CA

33. Success Description: Provided recycling opportunities to 12 rotating sea-going aircraft squadrons. This service provided as squadrons rotated from ship to shore and while hangar renovations were taking place.

Economic Benefits: Reduced solid waste disposal costs, increased recycling efforts and revenue.

P2 Environmental Benefits: Kept potential waste out of the landfill.

POC Name: Dawn Herrod
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NAVAL AIR STATION WHIDBEY ISLAND, OAK HARBOR, WA

34. Success Description: The total 2000 refuse decreased 44,000 pounds from 1999. The revenue generated by recycling increased from \$179,376 in 1999 to \$247,839.

Economic Benefits: The station saved \$3,894 in landfill costs and increased recycling revenues by \$68,463.

P2 Environmental Benefits: Solid waste was diverted from the landfill and the extra revenue will increase recycling efforts.

POC Name: Calvin Canton
Commercial: 360-257-5631 **Code:** Environmental Engineer
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35. Success Description: An in-vessel composting system (IVCS) was constructed at NAS Whidbey Island. It was funded through the P2 equipment program at a cost of \$799,000, which includes equipment and site improvements. The IVCS consists of five enclosed containers, in which the waste material to be composted is loaded. A blower supplies air into the containers and the outlet air passes through a bio-filter to reduce odors. A computer system keeps track of the material in each vessel (i.e., how much material, how long its been in, the temperature, and air-flow). The waste material is mixed together before it is loaded into the vessels. This material consists of food waste, green waste from ground maintenance, and wood chips. These are mixed together, in varying amounts, to come up with a recipe.

Economic Benefits: The IVCS was in operation for six months in 2000. This was a startup pilot period, accepting limited waste. The IVCS accepted 70 tons of food waste from food service facilities at the station and 24.1 tons of green waste from ground maintenance and from 200 of the family housing units. Eventually, green waste will be accepted for 833 single-family units. The landfill cost saved by composting the food and hard waste for the six-month pilot period was

COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL AIR STATION WHIDBEY ISLAND, OAK HARBOR, WA (continued)

\$4,661. There is no recycling revenue generated by composting since the end material is used on base. Full operation is expected to begin in 2001. Based on the results of this pilot period we expect approximately 2,463 tons of waste will be composted annually.

P2 Environmental Benefits: Diverted 94 tons of food and yard wastes from the landfill, saving valuable space. The end product of the composting is a nutrient rich material that is being used around the station to amend and beautify the soil. Use of the compost encourages plant growth and may result in a reduced need for fertilizers, pesticides, and water. Odors are kept to a minimum, since the waste is composted inside the closed containers and the air coming out is passed through a bio-filter. There is no vector attraction or exposure to pathogens with the in-vessel system, as compared to windrow or open pile composting.

POC Name: Calvin Canton

NAVAL BASE VENTURA COUNTY POINT MUGU, CA

36. Success Description: The Hueneme QRP collected and recycled 1,048 pounds (524 tons) of laser toner printer cartridges in CY00; prior to CY00, the base QRP did not collect these recyclable items.

P2 Environmental Benefits: Diversion of .524 tons of toner cartridges from landfill.

POC Name: Bruce Belluschi

Commercial: 805-982-1929

Code: MW000

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Email: belluschiba@nbvc.navy.mil

37. Success Description: By expanding the acceptable types of recyclable papers at Hueneme beyond "white paper only" for CY00, the Hueneme QRP diverted an additional 160,769 pounds (80.39 tons) of common office papers from our local landfills.

P2 Environmental Benefits: Diversion of 80.39 tons of office papers from landfill.

POC Name: Bruce Belluschi

38. Success Description: By implementing a wood pallet recycling program in CY00, approximately 15,615 pounds (7.80 tons) were diverted from our local landfills and recycled in CY00.

P2 Environmental Benefits: Diversion of 7.80 tons of wood pallets from landfill.

POC Name: Bruce Belluschi

39. Success Description: An audit was performed for all definite quantity three cubic yard trash bins at Hueneme to determine their current service level efficiency. The audit revealed: approximately \$72,780/annum may be saved in trash removal service costs by reducing the number of bin removal service levels to a more appropriate level; and an additional \$26,484/annum may be saved in trash removal service costs by reducing the number of trash bins located throughout Hueneme and perhaps not being used.

Economic Benefits: Total potential identified trash service cost savings = \$99,264/annum

POC Name: Bruce Belluschi

COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL STATION EVERETT, WA

40. Success Description: The recycling of plastic film at Naval Station Everett (NSE) has increased in quantity, to where Boise Cascade is now picking up our plastic film on site. This is saving us the cost for transporting it to their facility, which is 45 miles south of NSE. Boise Cascade uses the plastic in making plastic lumber. We have used plastic lumber for porches and decks at the pier side laundry on the station.

Economic Benefits: The landfill cost of \$141 per ton is now being avoided by recycling the plastic film.

P2 Environmental Benefits: The plastic film waste is no longer land filled.

POC Name: Gay D Gates

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Code: 418

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Email: gatesgd@everett.navy.mil

NAVAL STATION SAN DIEGO, CA

41. Success Description: Naval Station QRP collected and returned approximately 1,000 pallets each month to DDDC.

Economic Benefits: New pallets cost DDDC approximately \$12 each. Since the QRP began collecting, segregating, and redistributing the pallets, DDDC has saved approximately \$12,000 in pallet procurement costs each month.

P2 Environmental Benefits: Reusing pallets results in significantly reduced demand for virgin lumber used in manufacturing new pallets.

Other Benefits: Redistributing pallets save time and labor that QRP personnel would otherwise spend on grinding them into wood chips.

POC Name: Ted Schleutker

Commercial: 619-556-7222

Code: N4513

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42. Success Description: Reused a 2,400 square foot building. The former naval station ecology building had been vacant for nearly three years and had fallen into disrepair. Seabees from CBU-427 deconstructed the building and are in the process of rebuilding it at the naval station QRP site.

Economic Benefits: Saved procurement cost of at least \$100,000 for a new building. The building will be used as a warehouse for high value recyclable commodities. It will provide an extra measure of security, preventing theft of these materials. Anticipated project completion date is September 2001.

POC Name: Ted Schleutker

COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL SUBMARINE BASE SAN DIEGO, CA

43. Success Description: Toner cartridges were disposed of as a hazardous waste prior to last year. We now recycle them. The used toner cartridges are turned in to a company that refills them. This company supplies the Navy with reduced cost, refilled, cartridges.

Economic Benefits: Hazardous waste cost savings.

P2 Environmental Benefits: Reuse toner cartridges.

POC Name: Dan Frick

Commercial: 619-556-8162 Code: N4513

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NAVAL WEAPONS STATION SEAL BEACH, CA

44. Success Description: Twenty-seven tons of ABS plastic was about to enter the waste stream. The recycling center was able to locate a contractor that would purchase this commodity.

Economic Benefits: Saved several thousands in tipping fees and generated revenues for the recycling program.

P2 Environmental Benefits: The recycling program was able to divert 760 tons of waste that would normally go into the waste stream.

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NAVY SUPPORT FACILITY DIEGO GARCIA, IO

45. Success Description: A. The BOSC contractor was allowed to undergo cost savings and re-engineering initiatives on cardboard recycling at their own expense in May to December 2000. B. Diego Garcia has a green waste staging area where smaller plant parts are left to fall apart from branches and undergo natural decomposition. Only the big trunks and branches are incinerated.

Economic Benefits: A. The BOS contractor's initiated cardboard recycling project diverted 5.3 tons that usually goes to the incinerator and landfill. This resulted in a saving of \$7/ton based on the average operation cost of \$14.52 per ton. B. Reduced incinerator operation time and refuse that went to the landfill.

P2 Environmental Benefits: Top soil generation through natural composting.

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COMMANDER IN CHIEF, U.S. PACIFIC FLEET

PACIFIC MISSILE RANGE FACILITY HAWAIIAN AREA, BARKING SANDS, HI

46. Success Description: Effectively shipped 296.3 tons of scrap metal to DRMO and other outside recyclers.

Economic Benefits: Recycling of these materials appears to be the most cost-effective option for disposal. Generated revenue of \$1,395.

P2 Environmental Benefits: Aesthetics of the facility is greatly improved by removal of accumulated, unsightly scrap metal and unused metal drums, etc.

Other Benefits: Avoided landfilling of these materials.

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U.S. NAVAL FORCES MARIANAS SUPPORT ACTIVITY, GUAM

47. Success Description: A tire shredder installed at the landfill in November 2000 has greatly reduced the volume required for disposal of tires.

Economic Benefits: Since initiating tire-shredding operations in November, to the end of CY00, 171 cubic yards of tires were shredded to 115 cubic yards of tires to be land filled. This has decreased the amount of landfill space needed for tire disposal. An economic benefit has been achieved through reducing disposal costs for this waste stream.

P2 Environmental Benefits: Less landfill space is now required for the disposal of tires.

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CY 2000
POLLUTION PREVENTION ANNUAL DATA SUMMARY (P2ADS)
OTHER SELECT WASTE SUCCESS STORIES

BUREAU OF MEDICINE AND SURGERY

NAVAL HOSPITAL PORTSMOUTH, VA

1. Success Description: In 1999, we moved into our new Charette Health Care Center (CHCC). We began early to save wood pallets to assist in the moving of the equipment. After a very successful move, we had more than 2,800 used wood pallets that we had to dispose of in an environmentally proper way. Most of the pallets were sold to a local pallet recycler as a lot unit. Another installation reused 230 of our pallets for a project on their base.

Economic Benefits: We received over \$2,000 for our recycling program. If we had shipped the pallets to a landfill, we would have had to order extra dumpsters to accomplish the task. We avoided the added cost of about 80 additional dumpsters, at a cost of \$175 per dumpster, or a total avoided dumpster cost of about \$14,000.

P2 Environmental Benefits: By selling the pallets instead of sending them to be ground up for mulch or sent to the landfill, we saved on transportation, grinding fee, and landfill tipping fee.

Other Benefits: By selling the pallets to a recycler, we saved valuable resources, as well as the time to make new pallets. By giving some pallets to another facility, we saved the Navy money when they did not have to purchase more pallets.

POC Name: Edward A. Bick

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CHIEF OF NAVAL EDUCATION AND TRAINING

NAVAL AIR STATION MERIDIAN, MS

2. Success Description: We began using antifreeze-recycling equipment provided by NAVAIR through the Pollution Prevention Equipment Program for GSE gear.

Economic Benefits: When fully implemented, this initiative will save approximately \$472.74 for new antifreeze and \$120 in recycling costs annually.

P2 Environmental Benefits: Eliminates almost all used antifreeze at GSE.

Other Benefits: (1) This equipment connects directly to the GSE gear and provides preventive maintenance as well as fluid recycling. (2) Artisans claim that the process is labor intensive, but they are in a learning curve.

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CHIEF OF NAVAL EDUCATION AND TRAINING

NAVAL TRAINING CENTER GREAT LAKES, IL

3. Success Description: Asphalt and concrete is being taken to a local recycler who charges no tipping fee. Oil is also being taken at no cost for recycling.

Economic Benefits: No cost for recycling, oil and C&D.

P2 Environmental Benefits: Less material sent to landfill and new products from raw material.

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CHIEF OF NAVAL OPERATIONS

ADMINISTRATIVE SUPPORT UNIT SOUTHWEST ASIA

4. Success Description: NSA Bahrain's environmental program is extremely proactive in providing pollution prevention, recycling, spill prevention, hazard communications, and hazardous waste operations and emergency response education and training. We have partnered with local environmental and safety organizations and local schools to participate in clean up activities on the observance of national and international events including "Earth Day" and "America Recycles Day."

Economic Benefits: Over the past two years, U.S. Navy personnel in Bahrain have shown exceptional commitment to environmental protection and earned the admiration, respect, and recognition of the host nation. This dedication has strengthened the long-lasting relationship between the two countries and enhanced the U.S. Navy's image in Bahrain. Our on-going environmental awareness and community service were lauded by the host nation.

P2 Environmental Benefits: These activities endeavor to make environmental protection part of every day life and encourage local industries to invest in environmental protection initiatives that conserve natural resources and improve the overall quality of life in the State of Bahrain. As a small island situated in the Arabian Gulf Peninsula, Bahrain boasts many beautiful beaches and miles of undeveloped, yet polluted coastline. Thus, in early 1998, NSA Bahrain began a community service program to clean up beaches and other coastline areas, removing the trash and debris carelessly dumped by those unaware of its potential to contaminate the water. The beach clean up program continues to be highly successful and one of the most popular environmental events held in Bahrain.

Other Benefits: NSA environmental outreach programs have benefited countless people, both military and civilian. Over 75 local officials have attended environmental awareness training classes held at NSA Bahrain, and over 200 participated in NSA Bahrain beach clean up activities.

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CHIEF OF NAVAL OPERATIONS

ADMINISTRATIVE SUPPORT UNIT SOUTHWEST ASIA (continued)

5. Success Description: Recycled over 130 tons of used oil and oily rags, and over 17 tons of lead acid batteries. Drained about 4 tons of oil filters, crushed over 2.5 tons of fluorescent light bulbs, and punctured and recycled over 600 Kg of aerosol cans.

Economic Benefits: Recycling and other P2 activities have reduced our HW disposal cost by over \$500,000 in CY00.

P2 Environmental Benefits: Over 50% of our waste stream has been diverted from landfill disposal through the implementation of P2 initiatives.

POC Name: Awni M. Almasri

COMMANDER IN CHIEF, U.S. ATLANTIC FLEET

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MS

6. Success Description: CBC Gulfport has donated all of the clean concrete rubble to Congressman Gene Taylor's offshore reef project. This will be an ongoing project as there are plans to build multiple reefs by the State of Mississippi.

Economic Benefits: This has provided free material for the building of the reef and has cost the base nothing.

P2 Environmental Benefits: This has eliminated 51 tons of material to the landfill.

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NAVAL STATION PASCAGOULA, MS

7. Success Description: In 2000, Naval Station Pascagoula has recycled 31 tons more oil than in 1999 providing a 50% increase in revenue.

Economic Benefits: The station receives \$.152 per gallon for recyclable oil. With a 50% increase in revenue for 2000, the station generated \$1,894.87 dollars more than in the 1999 reporting period.

P2 Environmental Benefits: The closely monitoring of waste oil collection ensures the oil is not released to the environment and in turn the oil is recycled as alternate fuel.

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NAVAL AIR SYSTEMS COMMAND

NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION PATUXENT RIVER, MD

8. Success Description: Recycling has become much more involved in capturing recyclable debris. The Recycling Coordinator now attends all pre-construction meetings to establish what items can be recycled and makes site visits to construction projects to help identify and capture those items.

Economic Benefits: By capturing these items, especially scrap metal, cardboard and wood as well as concrete, we are increasing our tonnage sale to our scrap metal and paper vendors.

P2 Environmental Benefits: These items are not being disposed of in the landfill and concrete in some cases can be used for shoreline remediation. Wood can be used for mulching and animal bedding.

Other Benefits: By capturing these items, we can improve our recycling rate percentage.

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COMMANDER IN CHIEF, U.S. NAVAL FORCES EUROPE

NAVAL AIR STATION SIGONELLA, ITALY

9. Success Description: We avoided land filling 822.6 tons of C&D.

Economic Benefits: There were 822.6 tons of C&D recycled which cost \$4,271 (a reduction from the \$11,138 in tipping fees paid last year).

POC Name: Mauro Cacia

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10. Success Description: A bio-remediating parts washer was installed at the naval construction battalion vehicle shop. This machine uses microbes to get rid of grease and oil instead of solvents.

P2 Environmental Benefits: This provides elimination of a solvent waste stream.

POC Name: Myrna Martinez

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NAVAL SEA SYSTEMS COMMAND

NAVAL SHIPYARD PUGET SOUND, BREMERTON, WA

11. Success Description: Throughout our contracts, we require reuse and recycling of items whenever possible. Reuse: most of our contractors are encouraged by the ability to reuse items

NAVAL SEA SYSTEMS COMMAND

NAVAL SHIPYARD PUGET SOUND, BREMERTON, WA (continued)

and readily accept the opportunity to salvage materials for reuse on other jobs. In CY00, our contractors reused many different types of items (i.e., camel logs, light fixtures, steel frame windows, and nylon buoy rope). Recycling: the word is finally out! Not only does recycling concrete and asphalt save resources but it's less expensive than disposal. In CY00, our contractors sent 11,471 tons of concrete and asphalt for recycling.

Economic Benefits: Reuse: weights of these items were not noted so the savings in disposal costs cannot be calculated. Recycling: instead of \$54/ton tipping fees at the landfill (\$619,434), they paid \$12/ton tipping fee to recycle (\$137,652). Whether the \$481,782 in savings (78%) was passed on to the government depends on how each contract is written, but the benefit is tangible when exercised.

P2 Environmental Benefits: Reusing or recycling these items instead of just putting them in the landfill saves valuable resources.

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NAVAL SURFACE WARFARE CENTER CRANE, IN

12. Success Description: Demolition and removal of 26 pre-engineered, rigid frame, metal buildings, containing a total of 104,520 square feet, was included as part of a military construction project for NSWC Crane. The total cost for disposal of the excess buildings was estimated to be \$610,000. A decision was made to attempt to sell the buildings in place as scrap metal; thus reducing disposal cost. The Defense Reutilization Marketing Office (DRMO) was successful in marketing the buildings generating \$31,134 for the 757,520 pounds of steel.

Economic Benefits: Cost avoidance was \$610,000 while realizing \$31,134 from the sale of scrap metal.

P2 Environmental Benefits: The removal of the 26 buildings by a standard construction demolition contract would have generated a large quantity of debris requiring disposal in the permitted construction demolition solid fill site. The quantity of debris was greatly reduced by using salvage methods for removal rather than demolition techniques. Salvage techniques provided the added benefit of reuse of a major portion of the steel framing, thus avoiding the normal recycling process.

Other Benefits: The use of salvage techniques instead of normal demolition methods provided a more environmental friendly solution for the required removal of the buildings.

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NAVAL SECURITY GROUP COMMAND

NAVAL SECURITY GROUP ACTIVITY NORTHWEST CHESAPEAKE, VA

13. Success Description: Used the Defense Supply Center Richmond recycling oil contract (SP0410-98-D-4043).

Economic Benefits: Paid Public Works Center Norfolk 1.04 to 2.08 cents per pound. Cost \$2,000 for 55 gallons. We pay Safety Kleen (Defense Supply Center Contract), 18 cents per gallon. Cost \$10 to recycle 55 gallons. In addition, no cost for recycling oil purchased through the contract.

Other Benefits: I can not get tenant commands to purchase the recycled oil for satellite maintenance, because the Navy Satellite Operation and Maintenance requires quarterly oil replacement to be performed with new oil. The tenants claim the recycled oil will not meet the new oil specs. I've provided the documentation to the tenants identifying the quality of the recycled oil, with no results. I have started using Safety Kleen to pick-up the used oil for recycling because of the cost savings.

POC Name: Mark Woodington

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14. Success Description: The Marines are replacing damaged tire cell walls with a 4" thick gravel filled aluminum wall.

Economic Benefits: Cost to repair gravel filled walls is minimal compared to having to replace the entire cell wall every 5 to 10 years.

P2 Environmental Benefits: Removing over 50,000 tires from the marine range.

POC Name: Mark Woodington

NAVAL SECURITY GROUP ACTIVITY KUNIA, HI

15. Success Description: Replaced a large series of 12 volt lead acid batteries with high efficiency 12 volt batteries. This reduced the number of batteries to 25% of the original number without losing power capacity.

Economic Benefits: Reduces battery bank maintenance hours.

P2 Environmental Benefits: Reduces the amount of hazardous substances on site as well as decreasing the potential for a hazardous waste spill or injury.

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NAVAL RESERVE FORCES COMMAND

NAVAL AIR STATION JOINT RESERVE BASE NEW ORLEANS, LA

16. Success Description: In 2000, we began a program to recycle excess concrete being stored on-site.

Economic Benefits: We saved \$5,700 in disposal costs.

P2 Environmental Benefits: We diverted 212 tons of concrete from the landfill

Other Benefits: The program is a two phase program. The first phase is concrete recycling and second phase is asphalt recycling.

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COMMANDER IN CHIEF, U.S. PACIFIC FLEET

FLEET ACTIVITIES CHINHAE, KOREA

17. Success Description: Base recycled soil through local community contractor by properly segregating C&D and saving the disposal cost.

Economic Benefits: Base saving over \$176 in C&D waste disposal costs.

P2 Environmental Benefits: Estimated annual cost saving is \$1,000 for C&D, used oil and anti-freeze.

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NAVAL AIR FACILITY ATSUGI, JAPAN

18. Success Description: Increased recycling of C&D waste by 1,286 tons over the previous year. Recycled 84.4 tons of used oil in CY00. This is an increase of 14.4 tons (21%) above the CY99 level. Decreased used oil disposal by 98% over CY99 levels. Disposed of 70 tons of used oil in CY99. In CY00, disposed of 1.52 tons of used oil.

Economic Benefits: Used oil disposal and recycling costs went from a CY99 level of \$8,491 to a CY00 level of \$3,104. An overall 63% reduction in used oil management costs.

P2 Environmental Benefits: CY99 recycled 76.03 tons of OSW. CY00 recycled 1,398.64 tons. A greater than eighteen-fold increase in OSW recycling.

Other Benefits: Improved public image and support of regional recycling markets.

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COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL AIR FACILITY MISAWA, JAPAN

19. Success Description: NAF Misawa is severely constrained by Air Force control of the solid waste/refuse contract, the actions of the Japanese government and the lack of recycling markets in northern Japan. We have worked within these constraints when and where possible to comply with the spirit and intent of OPNAVINST 5090.1B to reduce and/or minimize both solid and hazardous waste. We have the best Hazardous Materials Management Program (HMMP) in the Far East and have been able to reduce the number of line items controlled by over 50% realizing an estimated \$10,000 savings over the past two years by reducing duplicate ordering. We have combined our hazardous materials and hazardous waste training with Air Force Environmental Flight reducing the need to fund off-island training--thereby saving an estimated \$10,000 per year. Additionally, this training partnership allows us to provide courses when needed and tailored to Japan and the Japanese Environmental Governing Standards that most contractors do not understand. We have been able to reduce the number of hazardous materials storage areas at the shop level from 35 to 15. The use of a "free issue" of usable hazardous materials has saved another \$5,000 per year. Navy units at Misawa can avail themselves of this free issue thus avoiding the problem of ordering small quantities of stock. This is important since the Air Force regulations do not allow any hazardous materials issued to be returned to the pharmacy. This control process has also allowed us to reduce the hazardous waste accumulation points from 20 to 11 within the past two years. Although we must operate under constraints outside of our control, we have developed a positive and pro-active program. We have won the FY00 CNO Environmental Stewardship Flagship Navy Community Award and are in competition for the White House Closing the Circle Award and the DOD/SECNAV/CNO Environmental Recycling Award.

Economic Benefits: NAF Misawa has diverted over 40 tons of solid waste from local landfills, reduced hazardous material line items by 50%, saving an estimated \$10,000 and implemented a free issue" program saving another estimated \$4,000. We established the only recycling program on the base with revenue of \$2,000 per year that supports local environmental events. NAF Misawa continues to aggressively seek opportunities to expand our programs.

P2 Environmental Benefits: NAF Misawa replacement of ethylene glycol with propylene has reduced the toxic properties of de-icing activities and ground/surface water contamination by over 1,000 gallons per year. Recycling efforts have eliminated 41 tons that would normally go to a local landfill. Control of hazardous materials issue through our authorized user list and reduction of hazardous material usage points has significantly reduced our hazardous waste disposal cost. The use of recycle profits has improved the host nation relationship with the U.S. Navy units assigned to NAF Misawa. Reduction of hazardous material and hazardous waste cost and partnership with the Air Force for training allows us to better use our limited resources.

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COMMANDER IN CHIEF, U.S. PACIFIC FLEET

NAVAL AIR STATION NORTH ISLAND SAN DIEGO, CA

20. Success Description: Fuel Farm recycling effort resulted in a highly successful recycling project by diverting 1,800 tons of concrete and 165 tons of rebar.

Economic Benefits: If the Navy were charged tipping fees, this project would have cost \$41.50 per ton to dispose at the landfill or \$75 per truck at the local recycler.

P2 Environmental Benefits: By crushing this material in place, the command eliminated trucking cost to the landfill as well as the pollution that would have been generated by the vehicles.

Other Benefits: The command now has 165 tons of Class 2 base available to use on other construction projects.

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NAVAL STATION EVERETT, WA

21. Success Description: The pre-treatment facility to date has recycled approximately 168,300 gallons of used oil or 1,144,440 pounds. We have recycled 30,000 gallons or 199,000 pounds in 2000 alone. We had special oil collection belts installed to efficiently collect the processed waste oil from the facility.

Economic Benefits: The disposal cost of 16 cents a gallon is now being avoided by recycling the waste oil. The recycling program has received over \$20,000 that has been used for various quality of life projects at NSE. The recycling program sells the oil to a local refinery for the going rate. The rate for 2000 averaged out at \$0.11 per gallon.

P2 Environmental Benefits: The waste oil is no longer disposed. It is a revenue source for the NSE recycling program.

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NAVY SUPPORT FACILITY DIEGO GARCIA, IO

22. Success Description: We recycled the 0.92 tons of used anti-freeze rather than off-island disposal using the Antifreeze Recycling Unit provided by the Pollution Prevention Equipment Program. The used lead-acid batteries were shipped to DRMO Guam for disposal-recycling is at their discretion.

Economic Benefits: Cost avoidance of about \$54,000 for burning the 302 tons of waste oil for energy recovery and recycling of 0.92 tons of anti-freeze.

P2 Environmental Benefits: Reduced the amount of waste in the landfill and in the hazardous waste storage area for disposal and storage.

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